FINAL REPORT
AUTO USE SURVEY:

ATLANTA METROPOLITAN AREA

Submitted To
Atlanta Regional Commission
Atlanta, Georgia

Prepared By

M. John Moskaluk
Project Director
&
James R. Marks

Georgia Institute of Technology
Engineering Experiment Station
Economic Development Laboratory
Atlanta, Georgia 30332

and

John Massey
Elrick and Lavidge, Inc.
Atlanta, Georgia 30302

August 1981

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This document was prepared by the Georgia Institute of Technology under contract with the Atlanta Regional Commission. The preparation of this document was financed in part by funds provided by Urban Mass Transportation Administration, Federal Highway Administration, and the Georgia Department of Transportation as part of the 1980 Joint Funding Project No. FRC-JF-04-08 and 1980 GDOT ARTPP Contract.

I. INTRODUCTION

One of the most interesting challenges facing a region is the development of a transportation plan for the public good. The definition of the factors, the quantification of these factors, and the solution of the problems are an integral part of that plan. A great many decisions are bound up in the process for which the transportation analyst has developed a decision support system into a comprehensive procedure. Part of the methodology utilizes analytical tools from which estimates of travel demand and mobility can be fashioned and then matched with the supply of transportation. The equating of these parameters yields a measure of service level for transportation. An analysis of these measures result in an estimate of need and the economic requirements to provide the desired level of transportation.

Input to these tools are a set of transportation data, socio-economic data, and land-use data that describe the current and future estimates of demand. Use of the tools develop estimates of travel patterns, modes and trip desires that will be placed upon the system. To accomplish the task of developing a transportation plan, the Atlanta Regional Commission has undertaken the collection of a comprehensive set of data that translates into the demand characteristics for the region. These data combined with other data sources such as the 1980 Census information and previous experience, form the basis of the transportation planning procedure.

Georgia Tech with Elrich & Lavidge, Inc. (E&L), were commissioned by ARC to collect one element of the established data set. This element was designated an Auto Use Survey for the Atlanta Region. The overall goal of this effort is to obtain household-level information on auto usage for work and nonwork trips in the region. An auto represents any household vehicles available for personal use by any household member. This report documents in summary form the survey design, methodology, and the execution of the Auto Use Survey for the Atlanta Region.

BACKGROUND

An Auto Use Survey is designed to overcome the difficulties associated with the traditional home interview origin-destination surveys. Mainly, the problems with the traditional method have been the under-reporting of nonwork trips and the misinterpretation of origin-destination questions. Consequently, the Auto Use Survey is designed to collect household level travel data which will supplement the 1980 Census journey-to-work data. Further, the data collected through this effort will compliment the work place survey and the onboard transit survey conducted by ARC and others. The Auto Use Survey provides key information to acummulate and summarize the data gathered through the various survey procedures.

Emphasis of the Auto Survey is the development of data which measures the all purpose trip rate, trip lengths, and the vehicle-miles of travel. To accomplish the quantification of these parameters, the Auto Use Survey technique requires a two stage interviewing procedure. First, a randomly selected respondent is interviewed via telephone. Such questions as county of residence, address, family size, auto ownership and household income are asked the respondent. Based on the results of this effort and agreement from the respondent, the second stage interviewing process is conducted. The respondents are requested to complete travel logs on a mutually agreed date. This effort requires the respondent to furnish information concerning individual trip patterns including the beginning mileage, ending mileage, departure and arrival times, number of family members traveling and trip purpose. Other information gathered are, the origin-destination of one trip, parking costs, type, year and model of personal vehicle, perceived cost of transportation and the socioeconomic impact of the current energy situation. Combined, a comprehensive picture is obtained at the household level of the demand for mobility and how the available transportation system is utilized to accomodate this demand.

Economic and time constraints preclude all households from taking part in the Auto Use Survey. Consequently, a sampling procedure was

designed to randomly select a representative sample of households within the region. This sample was designed to statistically measure the trip production variable (trips per household) and the trip distribution variable (average trip length). The sample size was determined using coefficients of variation from the 1972 Atlanta home interview data. It also considers the clustering effect of a household-level sample on the proportion of trips by purpose and average trip length. From this analysis, the proportion of trips by purpose was found to control sample size.

In determining the sample size, the analyst stipulates the level of accuracy and the confidence limit at the desired level of precision. Based on these values and previous experience, the appropriate statistical methodology is employed to calculate the sample size that achieves the desired specifications. It is reasonable to assume that as a survey is conducted the sample size will vary. The size will either be larger or smaller than the specification. Often this result occurs because of noncontrollable external constraints applied to the survey procedure. However, it should be recognized, that the actual sample size (response to survey) will dictate the statistical parameters. For example, if a larger size is achieved, it is probable that the level of accuracy and precision would be improved. In contrast, if a smaller sample is collected, the level of accuracy and precision would probably be widened. These conditions are true if the coefficient of variation based on 1972 information remains approximately the same. Thus, from an analysis of the data collected, the coefficient of variation, the accuracy, and the precision will be determined.

Once the data are summarized, a statistical analysis performed and understanding of the data achieved, it is necessary for the sample data to be weighted and expanded. This weighting and expansion is contemplated by ARC and is described in the ARC Work Program. A methodology for performing these operations is described in a later section of this report. A key data element to this weighting and expansion is the 1980 Census. The understanding of the author is that the census data will be available in 1982.

GOALS AND OBJECTIVES

The major mutual goals of data collection effort are:

- o Obtain household-level information on auto-usage for work and nonwork trips in the region; and
- o Obtain data to facilitate the development of a disaggregate data base for mode choice modeling from the auto use data, and ARC's Transit On-board and Workplace surveys as well as other data sources.

These goals have been translated into specific data requirements for each of the above ARC sponsored surveys. Further, it should be noted that all of the surveys should have a high degree of parallelism to allow merging of the data sets. That is a particular question asked in one survey should be asked in the same way in other surveys to allow for one meaningful interpretation. The specific data needs are:

- o Household person travel by mode and purpose;
- o Availability of alternative modes and choices being made; and
- o Origin-destination subsample.

To accomplish the above goals and to collect the necessary data, Georgia Tech with E&L performed a number of project tasks. Although these items are outlined in the contract as tasks, they are in fact, objectives which achieve the above goals. These objectives are.

- o Finalize and Test Survey Instruments

Georgia Tech with assistance from ARC prepared, tested, and finalized the survey instruments. As this process proceeded, it was realized by both parties that the survey needed to collect person travel information. To accomplish this newly defined need, a comprehensive set of instruments were completed.

- o Conduct Auto Use Survey

Elrich & Lavidge, Inc., assisted and monitored by Georgia Tech conducted the two part survey procedure. Telephone interviews were completed with more than 5,900 households. More than 4,900 households

agreeed to complete the travel logs and 1,072 households responded with completed forms. This represented 2,849 vehicle trips. A detailed discussion of the survey methodology employed and the response rates achieved are discussed in the body of the report.

o Assimilate Auto Use Survey Results

Georgia Tech edited, checked, and keypunched with varification all of the completed survey forms. This information was not summarized, weighted nor expanded. Individual household responses by type of form completed were installed on two IBM 9-track EBCDIC, 1600 BPI, standard label types. One copy has been given to ARC and the other kept by Georgia Tech as a backup.

The remaining sections of this report briefly summarizes the efforts of the project. Section II describes the methodology used and some of the problems confronted during the data collection. Section III discusses some of the data tabulation performed and the results obtained. Finally, Section IV presents the conclusions and recommendations. Perhaps Section IV is the most important because it suggests some of the actions that ARC needs to perform on the data during the summary process. It also points to some of the possible changes required to allow future data collection efforts to operate more smoothly and efficiently.

II. METHODOLOGY

An auto use survey involves the development of a sample design, development of survey instruments, selection of a representative random sample, collection of data via the instruments and processing the data collected. The methodology utilized in this project is geared to achieving the goals stated earlier. This is only one survey of ARC's comprehensive data collection effort; therefore, particular attention has been given to the design that affords merging of the data retrieved. Special attention has also been devoted to the parallel structure of the questions asked in the instruments.

Studies for two other agencies were reviewed so that their experience could be incorporated into the ARC survey. The first study was conducted for the Denver Regional Council of Governments [1/] and the second was for the Washington, D. C. Metropolitan Council of Governments.[2/, 3/]. As a summary, the Denver study was conducted to assess the impact of a compressed work week for federal agencies. The methodology included distribution of employee questionnaires and travel logs. These survey instruments were distributed and collected at the work place by a survey coordinator (federal employee). The author of the report indicated that the survey provided excellent results. The response for the employee questionnaire (primarily individual oriented with socio-economic data) was 93% and for the travel log (trip information) was 65%. It should be emphasized that the Denver study was conducted at the work place in a controlled environment at a time the respondents (federal employee) were captive and perhaps had a vested interest in the results of the survey.

1/ Denver Federal Employer Compressed Work Week Experiment, Denver Regional Council of Governments, Denver, Colorado: Cambridge Systematics, Inc. October 1979.

2/ Telephone Conversation, Mr. George Wickstrom, Washington, D.C., Council of Governments, September 1980.

3/ Proposal for Auto-Use Survey, RFP #130-2-8-80, Metropolitan Washington Council of Governments, John Hamburg & Associates, Inc., March 1980.

In contrast, the Washington, D. C. survey was a mailout instrument that requested both socio-economic and travel information on one form. Forms were sent to randomly selected households in the D. C. metropolitan area. Written instructions were provided and the selected households were instructed to mail back the instrument. At last report, approximately 30% of the survey instruments were returned. However, no information was available about the results of the survey.

The review of these surveys had an impact on how the ARC survey was performed. The Washington instrument suggested that the socio-economic and travel information should be separated. Also the lower response achieved in Washington in comparison to Denver suggested that more involvement by the survey agency could perhaps improve response rates and quality of the data.

The term "Auto Use" is a misnomer. Auto use implies that data are desired for only vehicle trips. When compared to the goal of gathering person travel information, the data collection effort requires expansion to accomplish the gathering of person travel information. During the development of the survey instruments, the survey design was broadened to incorporate person travel. This was accomplished by adding a household member log to the list of the survey instruments.

SURVEY PROCEDURE

For discussion purposes, the project methodology has been divided into a number of stages to assist in clarity. Although the stages are described as distinct processes, they are, in fact, laced together in an interactive-interdependent relationship. For example, a change in the structure of a question asked requires an analysis of other ARC surveys. Likewise, the addition of a survey instrument requires more forms to be printed, handled, retrieved, edited, interpreted and included in the data base. This rippling effect has been deleted from the discussion, but it should be recognized as being present and accounted for in conducting the survey.

The major stages of the methodology are:

Survey Design - The statistical procedures employed in determining the controlling parameter and the sample size.

Survey Instrument - The development, testing and finalization of the instruments to be used in the two stage process.

Data Collection - the procedure utilized in conducting the telephone interview, mailing the survey logs and the retrieval of the logs.

Coding and Editing of Data - the process used to range check each answer, manual check the forms and the telephoning of respondents to obtain added clarity.

Although the five stages above indicate a straightforward procedure, there are many opportunities for difficulties to be generated. The main reason for the problems, which are discussed below, is the external factors beyond the control of the procedures. Once the survey forms are sent to the respondent, the quantity and quality of logs returned are outside the control of the data collection effort.

SURVEY DESIGN

The sample size requirements were estimated by the ARC staff using statistical sampling procedures. Sample size can be estimated statistically if the following information is known:

1. the variables to be measured.
2. the mean and standard deviation of the variables.
3. the desired tolerance level and level of confidence.

As identified in ARC's Work Program for 1980 Decennial Data for Transportation Models, October 1979, the Auto Use Survey would supplement Census data by providing household level data for trip generation and distribution and to facilitate the development of a disaggregate file for mode choice modeling. It was determined that the sample size requirements of the following key variables would meet these objectives:

1. household trip rates stratified by household characteristics.
2. proportion of trips by purpose.
3. personal vehicle trip length.
4. percent transit of household trips.
5. subsample of origin-destination records.

The mean and standard deviation of the variables were taken from data previously collected in the 1972 Atlanta home interview survey. Cluster sampling requirements were applied using the proportion of trips by purpose, vehicle trip length, and percent transit. Default values for the "design effect" of cluster sampling were taken from survey data in other urban areas.[4/], [5/]

The level of precision was specified in terms of the desired tolerance level and level of confidence. Based on national transportation survey experience, it was determined that credible survey estimates could be attained at a tolerance level of ±5 percent and a level of confidence of 90 percent. That is, the sample travel estimates would be within ± percent of the true values 90 percent of the time.

Key Variables

Household trip rates. The sample design was stratified by cross-classifying the 1972 home interview data into twenty cells (0, 1, 2, and 3+ for auto availability and 5 ranges of household income). Cell frequencies, means, and standard deviations were determined, and the sample size was calculated at 850 households to provide the desired level of precision. It was further estimated that 1220 households would be required to provide the same tolerance level (± 5 percent) at the 95 percent level of confidence.

Proportion of trips by purpose. The sample design was based on providing accurate estimates by purpose by model choice. In 1972 the

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[4/] Data Requirements For Metropolitan Transportation Planning, NCHRP Report 120, 1971.

[5/] Guidelines for Designing Travel Surveys for Statewide Transportation Planning, FHWA, May 19767.

proportions were: 27.2 percent, home based work; 52.7 percent, home based nonwork, and 20.1 percent, nonhome based. As the smallest proportion, the nonhome based trip controlled. The sample size, adjusted for clustering, was calculated at 1830 households to provide the desired level of precision. Further, disaggregation of purposes, e.g., shopping at 15 percent or school at 8 percent, would be desirable, but would significantly increase the sample size. The result would be a high level of precision for the three main purposes with somewhat lesser precision for school, shop and miscellaneous purposes.

Personal vehicle trip length. The sample design was based on the mean and standard deviation of the 1972 trip lengths in minutes. The sample size, adjusted for clustering, was calculated at 325 households to provide the desired level of precision.

Percent transit of household trips. The sample design was based on estimating a transit share as large as 40 percent, and assuming that the remainder would go by private vehicle. Forty percent transit would represent trips to the CBD. Smaller shares would be at even higher levels of precision for the calculated sample size. The sample size, adjusted for clustering, was calculated at 305 households to provide the desired level of precision.

Subsample of origin-destination records. Past research in mode choice calibration indicated that disaggregate data bases with a minimum of 200 origin-destination trip records per purpose have been used to calibrate adequate models. Consequently, a target of 800 origin-destination trip records were established. After combining the 800 records with the weighted share of Transit On-Board Survey a total subsample of 1,000 origin-destination records was expected. This level is expected to provide adequate records to define the traveler classification approach that will be used in the logit model.

Determination of Survey Sample Size. Based on the above calculations, it was determined that 1830 households would be the target primary sample size with a secondary subsample of 800 origin-destination trip records. This level would provide the desired level of precision for the critical variable, proportion of trips by purpose.

The actual level of precision will be obtained from an analysis of the completed surveys. The level of precision will be sensitive to the actual number of completed surveys, the measured variance, the measured "design effect" of the cluster variables, and the aggregation level of the final model structures. The survey results will, in any case, still be valid, although at slightly higher or lower levels of precision than calculated in this analysis.

SURVEY INSTRUMENTS

Georgia Tech, with the assistance of ARC, had responsibility to develop, test, finalize and print the survey instruments. As was discussed earlier, the instruments were designed to collect person travel by all modes, including auto, transit and walking. To collect this information, five survey instruments were designed. Generally, the instruments can be divided into two groups which are designated as telephone instruments and travel logs.

The survey procedure involves two major steps. First, a randomly selected household is contacted via the telephone. The household is screened for inclusion in the survey and, if acceptable, a series of questions are asked. The last question of the telephone instruments requests cooperation in completing the travel logs. Thus, the second step requires the respondent to complete the travel logs. These logs require the respondent to furnish trip specific information regardless of their mode of travel. Combined, these instruments provide a complete household sample. Commonality among the survey instruments is maintained by the household telephone number.

The five survey instruments developed are:

Telephone Instrument

- Telephone Questionnaire
- Call Record Card

Travel Log

- Household Member Form
- Household Vehicle Form
- Company-owned Vehicle Form

A facsimile of these instruments are contained in Appendix A.

The names of the instruments are indicative of their usage. However, for clarity purposes, the instruments were utilized in the following manner:

- Call Record Card - Each telephone number selected in the random sample was recorded on a card. As that telephone number was called, a record was maintained of its disposition. Each number was attempted at least three times at which time the household telephone number was abandoned.

- Telephone Questionnaire - When a household was contacted and an individual appropriately identified, a comprehensive set of questions were asked. Many of the questions dealt with the household's socio-economic characteristics such as family size, income and licensed drivers. Other quetions addressed travel characteristics such as mode used to/from work, vehicle ownerhsip by vehicle type, and usage of MARTA. Included in the instrument was a question about energy conservation. This question has multiple parts to which the respondent was able to say yes or no.

- Household Member Form - The households receiving travel logs were requested to fill out this form for all travel by all household members. A correctly completed form reveals the number of person trips made, the purpose of the trip and the mode of travel. Walking was included as a mode of travel.

- Household Vehicle Form - The respondents were directed to place this form in the household vehicle. (NOTE: A form was sent to the household for each vehicle owned as determined from the telephone questionnaire.) Explicit instructions were given requesting the respondents to fill out the log at the beginning and end of each trip. Included in the information requested are the mode of travel, the beginning and ending mileage for each trip, the purpose of the trip, the number of occupants and the cost of parking. A completed form indicated the number of trips made by that vehicle and the mileage traveled during the day. A day was defined as a 24-hour period of time.

- Company Owned Vehicle Form - This form is similar to the household vehicle form except it was dedicated to vehicles owned by a company. This formed emphasized vehicle mileage and the number of trips made using a company owned vehicle.

In combination, these forms attempt to gather a comprehensive set of information from the households contacted through the random sampling process. The staff of Georgia Tech and ARC devoted a great deal of time

and consideration to developing the instruments. All of the instruments were pilot tested and revised based on the results of the pilot information. It should be recognized that a comprehensive set of data were required; yet, the forms must be as straightforward as possible. To assist in this effort, instructions and a sample of form completion were provided to the respondents. In addition, a telephone number was furnished so that respondents could ask questions about completing the forms.

DATA COLLECTION

The data collection can be divided into two major components. The first is the telephone interview and the second is the completion of the travel logs. Generally, a telephone number is selected at random. That number is called and the individual answering the telephone is screened for inclusion in the survey. If the household is not eligible, the next number is attempted and the process continued. Assuming the household is eligible, a series of questions are asked for which the respondent is urged to answer. At the completion of the instrument, the respondent is requested to participate in completing the travel logs. At this point, the appropriate travel logs are sent to the household with special emphasis on participation in the survey. After the prearranged date for completing the logs, an individual on the survey team contacts the household and attempts to pick up the forms. The specific steps involved in collecting the data are detailed below:

Step 1: Random telephone numbers were selected using a modified random digit dialing technique.[6/] Approximately 4,000 five digit numbers were randomly selected from the telephone book. Using the computer, the numbers were checked so that all Atlanta region prefix (NXX) numbers were included. Then, two random digits were added to the five digits. In this manner, approximately 27,000 seven

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6/ Laird Landing, et. al., "Relative Efficiency and Bias of Plus-one Telephone Sampling," Journal of Marketing Research, Vol. XIV, NO, 3, August 1977, p. 295.

digit telephone numbers were generated. A representative sample based on population was developed by wire center to distribute the 27,000 numbers throughout the region.[7], [8] The desired distribution by Census tract is shown in Appendix B.

Step 2: Call record cards were imprinted with the one telephone number per card. These cards provided an accounting trail to control the telephone portion of the data collection effort.

Step 3: With the Call Record Card, an interviewer called the telephone numbers and screeened the individual answering the phone for inclusion in the survey.

Step 4: Upon identifying an appropriate household member, the interviewer asked the questions on the Telephone Questionnaire. At the completion of this instrument, the respondent was asked if they would fill out the mailout forms. A positive response meant that the following steps would be undertaken.

Step 5: The name (if available) and address of the agreeing respondent was entered into a master file of instruments mailed.

Step 6: From the Telephone Questionnaire, it was determined how many household vehilce forms and company-owned forms to be sent to each household. All households, even those without a vehicle, received a Household Member Form.

7/ Block Statistics for the Atlanta Urbanized Area, 1970 Census of Housing; U.S. Department of Commerce, Bureau of the Census, September 1971.

8/ 1979 Population and Housing Estimates for the Atlanta Region; Atlanta Regional Commission, October 1979.

Step 7: The envelopes were hand addressed and stuffed with the appropriate number of forms.

Step 8: The night before the predetermined date to complete the forms, the household was contacted by telephone. They were reminded to complete the forms, and again the importance of their participation was stressed.

Step 9: On the predetermined date, the household receiving the forms filled out the instruments. A telephone number was supplied to answer questions if the respondents had problems.

Step 10: Approximately three days after the respondents were to complete the questionnaire, the household was again contacted and arrangements made to retrieve the instruments.

Step 11: At the time of retrieval, the household was asked the origin and destination of one randomly selected trip filled out on the log.

Step 12: The instruments were returned for inclusion in the survey.

The process as explained is quite straightforward. However, it is very dependent on the willingness and cooperation of the responding household. A number of difficulties were discovered during the data collecting effort.

The low response rate generated additional data collection. An extra effort was made to again contact the households with completed travel logs but with incomplete origin/destination information. These households were telephoned and origin/destination information solicited. At the same time, this information was sought, clarification questions concerning the logs were also asked, if necessary.

CODING AND EDITING OF DATA

The forms which were returned from the field, and the telephone survey forms had to be manually edited and coded before they were sent for keypunching. The editing entailed consistency checks within an individual form and between forms from a household, and checking of codes on telephone surveys. After all the editing procedures including telephone call backs, the forms were sent for keypunching and verification.

Consistency Checks

When forms could be identified as being from the same household (same phone), they were checked to make sure the data was consistent. Mainly, this consisted of verifying that all trips by household members recorded on the vehicle forms were accounted for on the household member form. Of course, this was complicated by the fact that not all people recorded on the vehicle form were household members and not all household member trips made by auto were made in vehicles from the household. Therefore, these consistency checks inevitably involve some subjective judgments, although these were kept to a minimum. Some examples of common inconsistencies follow.

Apparently some households used the household member form just for trips not recorded on the vehicle forms. This would be apparent in cases where there were a few walk or bus/MARTA trips recorded on the member form but the vehicle forms indicated several trips by car. These trips were put on the member form. However, these member forms were put aside for telephone calls to verify this substitution. In general, if they could not be verified, they were rejected.

The household member form was sometimes not filled out at all. This was just treated as an extreme case of the above. A form was generated only if it could be verified by phone. On the other hand, a blank member form could also indicate no trips. If there was some positive evidence that this was the case, the form was accepted and zero trips filled in. For example, quite often the respondent made a note to the effect that there were no trips made. Of course, if they actually filled in "0" under number of trips, this was accepted.

One other inconsistency was the failure to record children's trips. This might be indicated if there were only 2 members indicated on the member form, but one vehicle had 3 people going to "school" and then 1 to "work". This would indicate that there were 2 school children. This was also handled as the generated forms above.

Correct coding of forms

Each form was also checked for consistency within itself. There were a number of potential problems here. The most notable was the question of one-way vs. round trips. Many respondents listed round trips, indicating that instructions given were not always sufficient. These trips were easier to pick up on the household vehicle form by examining the trip length and time taken. For example, a 3-mile shopping trip starting at 6:00 p.m. and ending at 9:00 p.m. was most probably a round trip. Usually this practice was followed for all trips on a form, so the interpretation was usually consistent. Discovering this error on the household member form was very difficult unless there was a vehicle form to correlate with. In many cases, a member would not end up the day at home. This could usually be traced to this error, except in cases where a member worked at night.

Many household member forms were returned with one or more (in some cases all) of the 8 member rows filled out with a great number of work trips and nothing else. These were usually rejected as unintelligible. In other cases, it was apparent that trips were recorded for more than one day. This was sometimes actually indicated by dates. Also, it could be discovered by looking at the times recorded on the vehicle forms. Only the correct day's data was used if it could be determined.

Trip patterns were also examined for consistency. For example, mileage sequences were corrected if the beginning mileage was not equal to the last end mileage, and greater than the current end mileage. The question "Was this trip to or from home?" was often answered incorrectly. Usually an inspection of the trip pattern could reveal the correct answer.

Code data

Appropriate codes were placed on the forms. The telephone questionnaires were largely self-coded by the interviewer. The exception was the set of questions about vehicles. These were coded based on a list of manufacturer and vehicle size codes drawn from various EPA mileage guides (EPA)[9/] as well as the investigators knowledge. These codes are found in Appendix C Table C-1.

The other forms were coded in accordance with standard procedures outlined in Appendix C Table C-2. Origin-destination subsample data were coded by itself in 80-column format. This format and those of the other files are found in the appendix on data formats.

After the data for all forms were edited, the data were converted to tape for computer storage. Editing and correcting of the data was done at the Georgia Tech CDC cyber 70 facility because of greater ease of access and greater experience of personnel with this system. The data was then transferred to the Atlanta Public Schools System IBM 370 for use by the Atlanta Regional Commission. Coding standards are shown in Appendix C, Table C-2.

Keypunch to tape

The data were keypunched directly from coded forms to magnetic tape by Professional Data Entry with 100% verification. Magnetic tape was chosen over punched cards because of the volume of data handled. The magnetic tapes were written with standard IBM labels which necessitated special handling at the Georgia Tech CYBER computer. However, the facility had utilities for handling these tapes and the data sets were loaded to disk for further manipulation and editing.

Editing checks and conversion to IBM

Each file was checked for various errors. These mainly consisted of range checks on items as well as mileage checks on the

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9/ (EPA) Gas Mileage Guide for New Car Buyers, Environmental Protection Agency and Department of Energy (formerly Federal Energy Administration), annual, 1975-1981.

vehicle forms. Each file was also sorted by telephone number to facilitate matching of data. Although "master" records were originally envisioned, it was decided that handling of these records would be too cumbersome and would also waste storage.

After editing checks were performed, the files were updated manually. Addresses on the telephone questionnaire file were scanned visually for spelling errors, and corrected. The corrected files were written onto separate unlabelled tape volumes for transfer to the IBM facility. There the files were loaded to disk and backed up on one master IBM 9-track EBCIDIC, 1600 BPI standard label tape volume. These volumes have been turned over to the Atlanta Regional Commission. The data file format may be found in the Appendix C, Table C-3.

Standard Label Tape

The final step of the editing process is the development of an IBM, Standard label, 9 - track, 1600 BPI, EBCDIC data tape. One copy has been given to ARC and one copy has been kept by Georgia Tech.

The response rates varied among the various forms utilized. For example, the telephone survey had a very high rate of completion with 80% of the households agreeing to complete the distributed travel logs. Also, the screening of households for inclusion in the survey was high. Approximately 1 of 4 telephone numbers resulted in a household for inclusion. On the other hand, the response rate to the travel logs was low. Approximately 20 percent of the travel logs were judged acceptable for inclusion in the survey. As was outlined earlier, this result changes the statistical parameters of the survey. It does not mean that the survey data is erroneous. It does mean that a non response analysis is required but was not undertaken as part of this effort.

PROBLEMS IN RESPONSE

The success rate of the telephone questionnaire was much higher than expected. The target of 4,500 completed interviews was reached using only about 21,000 out of the 27,000 generated telephone numbers. The response rate, therefore, was about 25% rather than the expected 16%.

However, this created a problem in reducing the sample size after the start of work. The telephone survey was conducted in geographical areas for the purposes of the logistics of picking up the mailouts. As a result, the first area worked in (generally NW, mostly Cobb County) is over-represented in the sample.

A problem of more concern was the response to the mailout. This response was very low, particularly in close-in areas of town. There are two reasons for this. First, it is to be expected that only a certain percentage of people will respond to such a survey. Also, past experience indicates that response does vary according to income and educational level of the respondent. This would account for some spatial bias. Also, in this case, there was a great deal of difficulty in locating people and picking up forms. With early sunsets in November (when the forms were picked up), there was great concern for the security of survey personnel especially in downtown areas. This also affected the spatial bias in the response rates.

Based on respondent agreement, 4,744 travel log packets were mailed to households in the region. Packets were retrieved from 1,897 households of which 1,117 packets were judged acceptable for inclusion in the survey. The other packets were rejected for various reasons such as non-completed forms, incorrectly completed forms, and nonrectifiable forms. If only one form from a packet was judged acceptable, it was included in the survey even though other forms from the packet were rejected.

III. ANALYSIS

Only the initial steps were taken in the analysis of the data collected in the survey. These steps are not conclusive nor do they give complete statistical information of the data. The following should be viewed as an indication of the wealth of information available from the data base. Extensive analysis is necessary to completely understand the magnitude of the data. Some recommendations are suggested for a complete analysis in Part IV of this report. The following should be considered an overview; no conlusions are made because the analysis is too preliminary.

RESPONSE RATES

The survey was distributed using the telephone company's concept of wire centers and the population within the respective centers. These centers were aggregated by ARC districts and shown in Figure 3-1. This will be the basic geographic reporting unit. At this level of analysis, the wire center concept is maintained and the response rates are shown by district. The response rates for various parts of the survey varied by location and income. Also there were various responses by survey. In other words, we cannot talk about a general "response to mailout." After all, there were three different forms mailed out and each has its own response rate. Many households did not complete all the instruments sent them and even if they did, the forms might not have all been useable. Therefore, each form will be discussed separately.

Telephone questionnaire success rates are shown on Figure 3-2. The numbers in parentheses are the actual number of completed interviews in each area. Based only on the number of completed questionnaires there is a statistically significant difference in success rates for different parts of the study area. This variation is both a function of socio-economic characteristics of households and the distribution of businesses within the area.

Figure 3-1

WIRE CENTERS BY DISTRICT

IN THE ATLANTA REGION

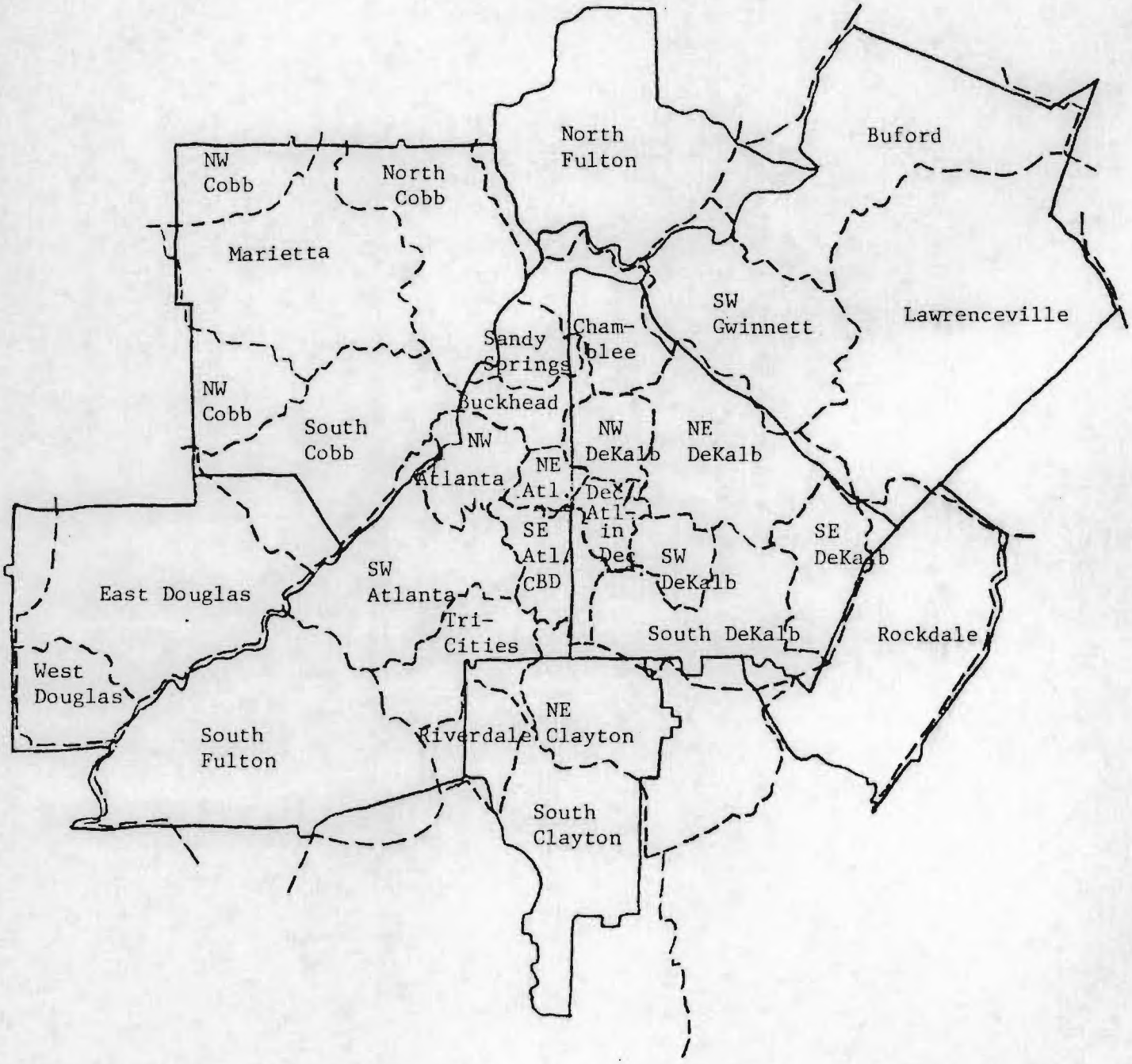
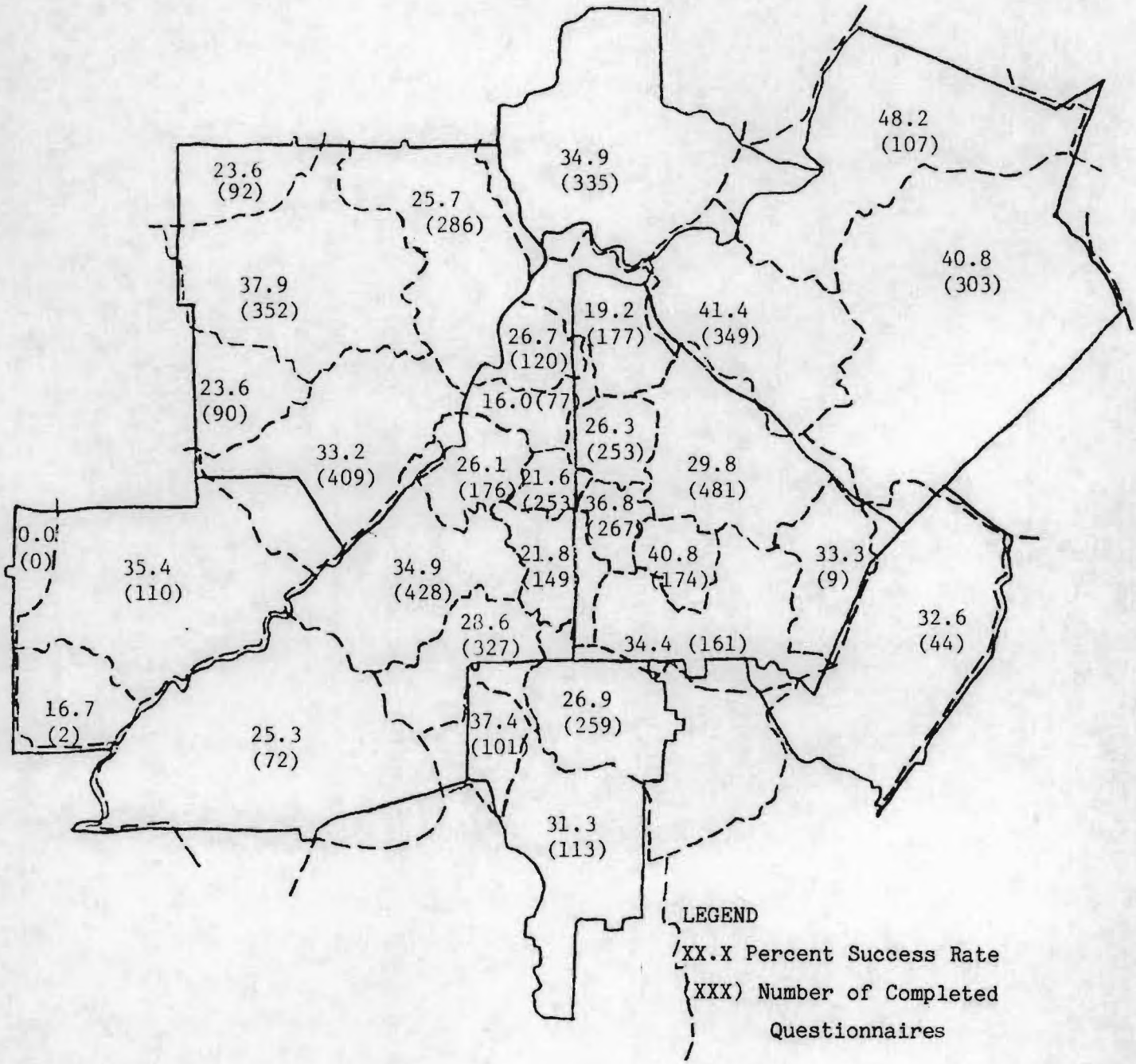


Figure 3-2

COMPLETED TELEPHONE QUESTIONAIRES

BY WIRE CENTER



Mailout form response rates are shown in Figures 3-3, 3-4, and 3-5. Again, the spatial distribution is statistically significant and can be seen to be lower in NW and South Atlanta, Rockdale County, South Clayton, North Gwinett and parts of Cobb County. Higher responses were obtained in Buckhead, Sandy Springs and NE Atlanta, as well as the Tucker-Stone Mountain area of DeKalb County. This is partially due to the logistics of pickup, especially in far-out areas and the inner city. There is also some socio-economic factors which show up in the spatial distribution. Table 3-1 shows the response rate to each of the mailout forms broken down by household income as reported in the telephone interview. As can be seen, the response increases with increasing household income, except for the final income category. The trend is similar for all forms.

These variances in response rates have important implications for the use of these data. Variances in response are to be expected and are not, in and of themselves, bad. However, if the data are to be used to predict overall tripmaking, some weighting must be done in order to make the data more closely represent the actual population.

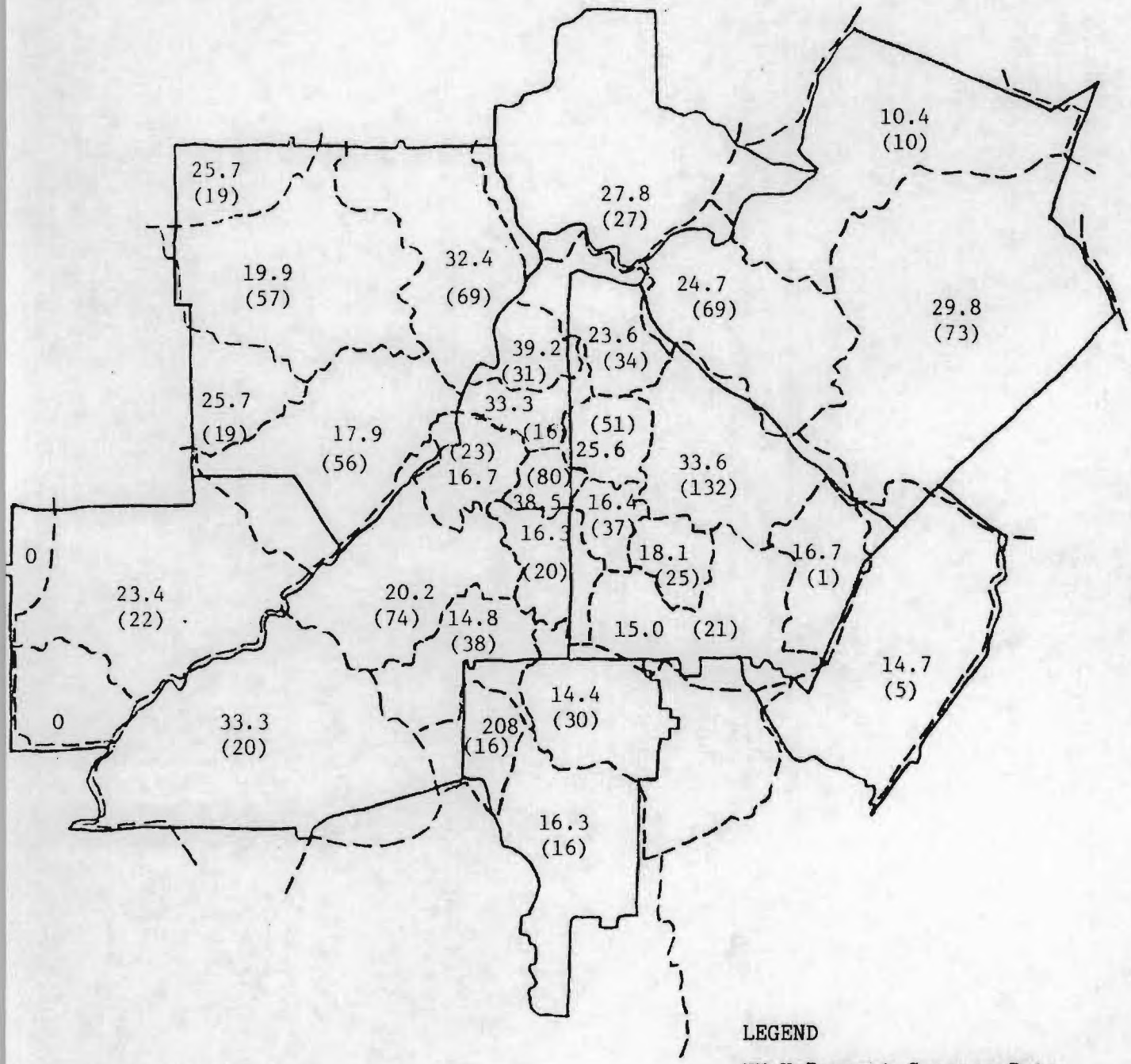
The two main factors which have affected response are income level and location. Of course, there is some interaction between these factors, but we believe each to be important. Unfortunately, population profile data from the 1980 Census were not available at the time of the data collection. Therefore, data weighting will have to be done at a later time and is planned as shown in the ARC work program.

The addresses from the telephone questionnaire will have to be matched to census tracts so as to have comparable areas. The statistics above and those to follow are divided by "districts" which roughly correspond to the superdistricts used by ARC for transportation planning. The "districts" are simply aggregated wire centers, as these could be determined from the telephone number recorded on each survey instrument.

Figure 3-3

RESPONSE TO HOUSEHOLD

MEMBER FORMS



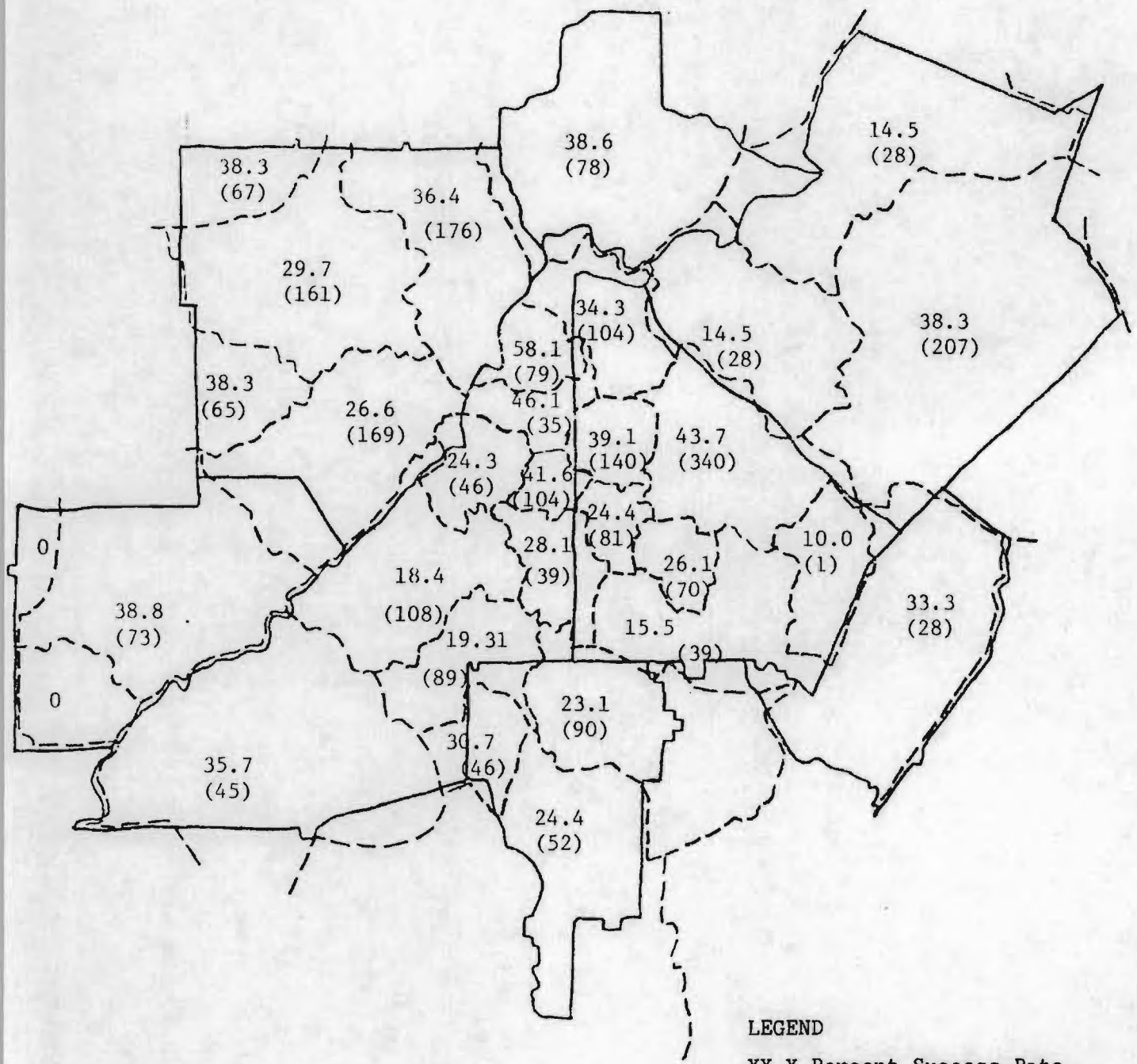
LEGEND

XX.X Percent Success Rate

(XXX) Number of Completed Forms

Figure 3-4

RESPONSE TO HOUSEHOLD VEHICLE FORMS



LEGEND

XX.X Percent Success Rate

(XXX) Number of Completed Forms

Figure 3-5

RESPONSE TO COMPANY OWNED

VEHICLE FORMS

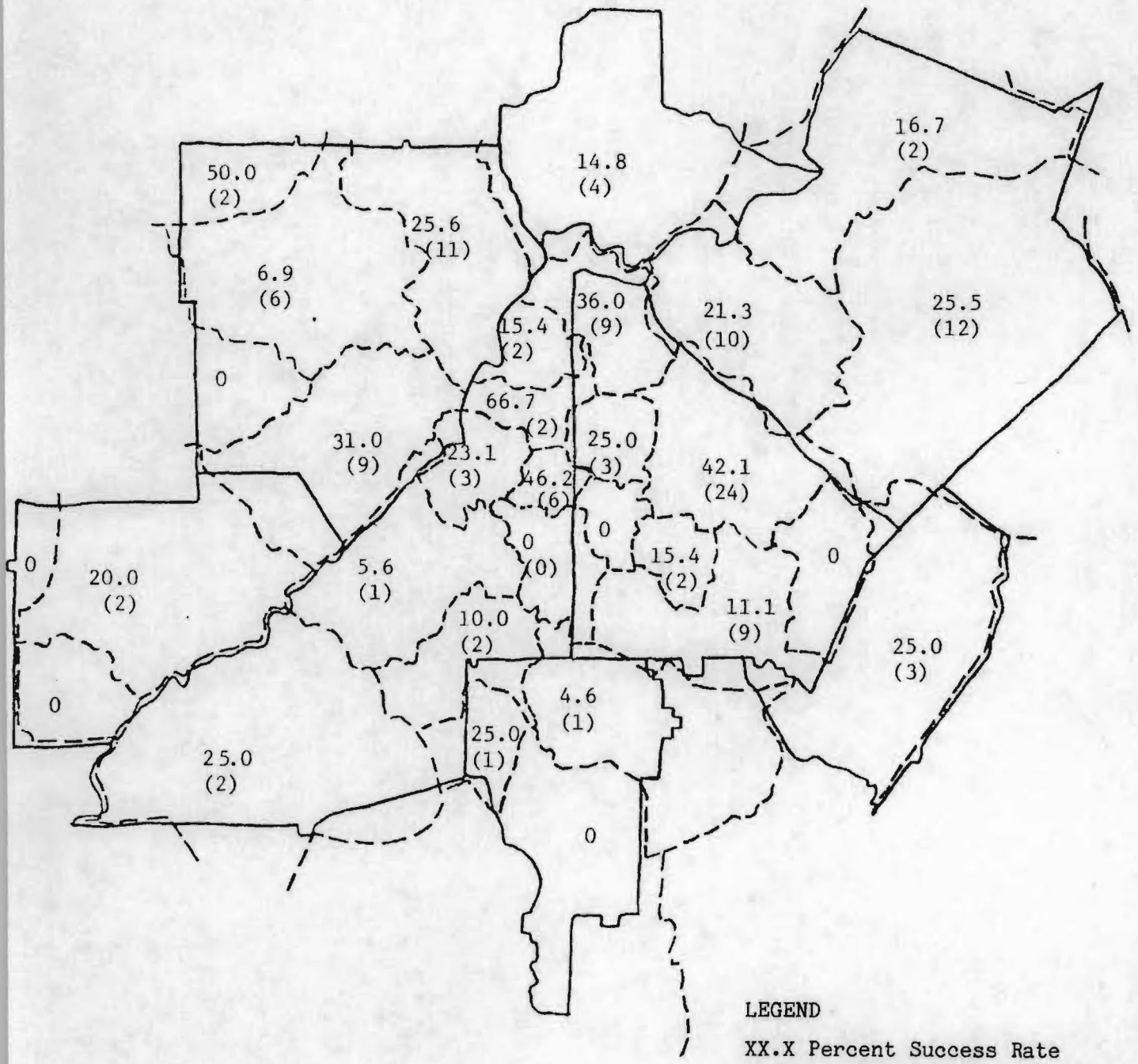


Table 3-1

MAILOUT RESPONSE BY INCOME

INCOME	Member Form			Household Vehicle			Company-Owned Vehicle		
	#Sent	#Recd	%	#Sent	#Recd	%	#Sent	#Recd	%
$0-$5000	284	48	16.9	220	37	16.8	7	0	0
$5000-10000	378	61	16.1	443	92	20.8	15	2	13.3
$10000-15000	575	110	19.1	881	209	23.7	28	5	17.9
$15000-25000	1119	266	23.8	2143	661	30.8	95	21	22.1
$25000-35000	804	223	27/7	1750	675	38.6	112	29	25.9
$35000-50000	488	148	30.3	1165	485	41.6	82	23	28.0
$50000 and over	263	72	27.4	692	222	32.1	79	21	26.6

NOTE:

Numbers will not total to other reported totals since income was not correctly coded on some questionnaires.

Selected Data Summaries

The summaries shown below are unweighted. Weighting is planned by the ARC staff upon the availability of the 1980 Census data. It should be recognized that these summaries are only initial attempts. No conclusion should be drawn and it is possible that the values shown will vary with those in the final analysis.

Telephone Questionnaire Information

Tables 3-2 through 3-6 show a tally of the various parameters reviewed. Table 3-2 reflects household size in terms of frequency, present and cummulative percent. The average household size is 3.07 with standard deviation of 1.524 based on 5,916 cases.

Table 3-3 shows the household income by the frequency of occurence percent and the cummulative percent. The average household income is $25,118

Table 3-4 indicates the number of drivers per household. Few households have per three vehicles although one household reported 16. The average vehicles over household is 1.995 with a standard deviation of 1.19 based on 5,891 cases.

Table 3-6 shows the responses to the ten energy-related questions. Most people have not taken the more drastic measures (move, changejobs, change mode) which were identified. However, a substantial number reported having made changes in their travel habits (activities closer to home, call instead of go). The response to question 3 indicates that more could be done in the area of carpooling. A surprising percentage (given the cost of new cars) of people reported having purchased a more gas-efficient vehicle. Of course, a good number of these purchases probably involved other reasons than just fuel conservation.

Table 3-2
TELEPHONE QUESTIONNAIRE
HOUSEHOLD SIZE

Household Size	Frequency	Percent	Cumulative
1	755	12.8	12.8
2	1742	29.4	42.2
3	1282	21.7	63.9
4	1198	20.3	84.1
5	607	10.3	94.4
6	330	5.6	100.0

Table 3-3
TELEPHONE QUESTIONNAIRE
HOUSEHOLD INCOME

Household Income	Frequency	Percent	Cumulative Percent
Less then $5000	367	7.9	7.9
$5000-9999	444	9.5	17.4
$10000-14999	668	14.3	31.7
$15000-24999	1324	28.4	60.2
$25000-34000	942	20.2	80.4
$35000-49999	585	12.6	92.9
$50000 and over	329	7.1	100.0

Table 3-4

TELEPHONE QUESTIONNAIRE
NUMBER OF DRIVERS

Household Drivers	Frequency	Percent	Cumulative Percent
0	252	4.3	4.3
1	1246	21.0	25.3
2	3143	53.1	78.4
3	857	14.5	92.8
4 or more	424	7.2	100.0

Table 3-5
TELEPHONE QUESTIONNAIRE
VEHICLE OWNERSHIP

Vehicle Per Household	Frequency	Percent	Cumulative Percent
0	429	7.3	7.3
1	1451	24.6	31.9
2	2537	43.1	75.0
3	993	16.9	91.8

Table 3-6
TELEPHONE QUESTIONNAIRE
ENERGY QUESTIONS

Have you taken any of these actions in the past 2 years?:

	Yes	No	N/A
1. Move your home closer to your work?	1099 18.6	4282 72.6	514 8.1
2. Change jobs so that your work is closer to your home?	736 12.5	4629 78.6	526 8.9
3. Car or van pool more often?	1506 25.6	4136 70.2	247 4.2
4. Change your type of transportation?	1352 23.0	4427 75.2	109 1.9
5. Shop closer to home?	4759 80.8	1106 18.8	23 0.4
6. Plan social or recreational activities closer to home?	3873 65.3	1919 32.4	76 1.3
7. Plan to combine several activities into one trip?	4974 83.9	852 14.4	39 0.7
8. Increase use of other forms of communication such as telephone and letters rather than transportation?	4342 73.9	1506 25.6	24 0.4
9. Purchase a more gas efficient vehicle?	2194 37.4	3521 60.0	157 2.7

Travel Log Information

A number of analyses wee run using the data obtained via the travel logs. Some tables comparing trip rates versus household, travel mode and trip purpose were generated. After an extensive review of the tables and discussions with the ARC staff, it was concluded that this information should not be included in the report. The major concern and the reason for this deletion is the risk of misinterpretation. As been mentioned numerous times, conclusions from the data are not yet possible and require an extensive analysis which is planned by the ARC staff.

Before the comprehensive analysis is performed, it is suggested that the various data files be merged into one file using the telephone number as the basis. This merging can be compared to the current ZAP file of the Atlanta region. Further, to obtain a complete understanding of the trip making patterns, it is suggested that the trips be linked. The linking of trips will permit a better analysis of trip rates by purpose. For example, a trip stopping at the store on the way home from work will be lost as a home-base work trip. A linked trip will not be lost and it will be tallied correctly.

WEIGHTING OF SAMPLE

The most obvious sample bias that appears in the data are the geographic area and the income levels of the respondents which were expected. If we define the geographic area as 'i', the income levels as 'j', and the individual responses as 'k', then the objective of weighting could be shown as:

$$X_{ijk} \rightarrow \bar{X}_{ij} \rightarrow \overline{WX}_i \rightarrow \overline{WX}$$

where

X_{ijk} the individual response "k" for the "j" income level for the "i" geographic area.

X could be trip generation by household, or trip length or any particular variable of interest.

$$\bar{X}_{ij} = \frac{\sum_{k=1}^{q} X_{ijk}}{n}$$

where

q - the number of responses for the variable of interest in the "j" income level for the "i" geographic area.

$$W_{ij} = \frac{NH_{ij}}{nH_{ij}}$$

W_{ij} - the expansion factor for the geographic area.

NH_i - total number households in the geographic area from Census.

nH_{ij} - total number of useable houshold responses in the geographic area for the variable of interest by income groups from sample.

$$\overline{WX}_i = \frac{\sum_{j=1}^{n} W_{ij}\,\bar{X}_{ij}}{\sum_{j=1}^{n} W_{ij}}$$

$\overline{WX}_i$ = the weighted average for the geographic area for the variable of interest, and

n = number of income levels

Then for metropolitan area

$$GW_i = \frac{H_i}{h_i}$$

where GW_i = the geographic area weight

H_i = total households in the geographic area from Census

h_i = total households in the geographic area from sample

$$\overline{\overline{WX}} = \frac{\sum_{i=1}^{P} GW_i * \overline{WX}_i}{\sum_{i=1}^{P} GW_i}$$

$\overline{\overline{WX}}$ = the weighted average for the variable of interest for the entire metropolitan area

The variance for these estimates from which confidence intervals can be calculated are:

$$\text{Var } X_{ij} = \frac{\sum_{k=1}^{q} X^2_{ijk} - \left(\frac{X_{ijk}}{q}\right)^2}{q-1}$$

$$\text{Var } (Wx_i) = \frac{\sum_{j=1}^{n} W_{ij} * \text{VAR } (\bar{X}_{ij})}{(\sum W_{ij})^2}$$

$$\text{Var } (\bar{WX}) = \frac{\sum_{i=1}^{p} GW_i^2 * \text{VAR } (\bar{WX}_i)}{\sum_{n=1}^{p} GW_i^2}$$

Obviously, the above variance equations assume no variance among the W_{ij} and GW_i values.

IV. Recommendations

After a review of the data collection effort and the brief analysis perform, there are a number of suggested recommendations that can be made. Perhaps it is best to consider this recommendation in two parts. First, there are the recommendations that pertain to data analysis and can be termed data analysis recommendations. The second part deals with the data collection effort and can be termed data collection recommendations. The following are a set of general recommendations which are suggested.

DATA ANALYSIS RECOMMENDATIONS

All of these recommendations have been discused with the ARC staff and many are included in the ARC work program. The recommendations appear here because they reinforce the work program and are necessary extensions of the present effort.

- Merge the data from the various tape files using the telephone number as commonality amount files.
- Summarize the data into data base file similar to the present ARC ZAP file.
- Link the trips so that a complete analysis can be performed for the various trip purpose.
- Perform a statistical analysis of trip rates, and trip length by trip purpose to determine the level of accuracy and reliability.
- Perform a nonresponse analysis using the socio-economic data collected through the telephone questionnaire.
- Weight the sample data based on the availability of 1980 Census information.
- Merge the Auto Use Survey Data with data collected through the On-Board Transit Survey and the Work Place Survey.
- Summarize all of the data sources into a comprehensive data base file for the future planning activities contemplated by ARC and the GDOT.

DATA COLLECTION RECOMMENDATIONS

- The telephone questionnaire utilized worked well, and it is suggested that future efforts could use a similar form.
- Allocate more resources in anticipation of a low response to travel log; the approximate cost per completed survey is $82.00 per household.
- Simplify the travel logs in terms of the numbers forms used and the information requested.
- Provide media coverage to the survey stressing its importance and how it will be used to improve transportation in the region.

In conclusion, the authors believe that the data collection effort proved to be successful and productive. A nonresponse analysis is currently planned by ARC and is essential so that the daa ramifications can be fully understood. The Auto Use Survey data combined with the other survey information and other data bases will provide ARC with necessary data base to conduct contemplated planning activities.

APPENDIX A

SURVEY INSTRUMENTS

ARC TRANSPORTATION STUDY QUESTIONNAIRE (1) Phone# 2-8 [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Since your home is within the area of interest to the Atlanta Regional Commission, your responses to this survey are very important to the transportation planning of your community.

1. What county are you in? . . . . . Clayton . (1)
Cobb . . .(2)
DeKalb . .(3)
Douglas . (4)
Fulton . .(5)
Gwinnett .(6)
Rockdale .(7) [ ] 9

2. How many phone numbers does your household have? . . . . . [ ] 10
don't know(8) refused(9) seven or more(7)

3. Including yourself, how many people live in your home? . . . . . [ ][ ] 11-12
don't know(98) refused(99)

4. Including yourself, how many licensed drivers live in your home? . . . . . [ ][ ] 13-14
don't know(98) refused(99)

5A. Do you work outside the home? . . . . don't know(8) refused(9) yes(1) no(2) [ ] 15
(If yes, go to 5C.)

5B. Does someone else in your household work outside the home? . . . . . [ ] 16
don't know(8) refused(9) yes(1) no(2)
(If no, go to Question 6.)

5C. How do you/they usually get to work? (Code only one. If any part of the trip is by bus or train, code bus or train. If by bus and train, code train. Read list.) . . . . . driving alone . . . . . (1)
(If 1, go to 5D.1.)
in a car or van pool . . . . . .(2)
(If 2, to to 5D.1.)
bus . . . . . (3)
(If 3, go to 5E.)
MARTA train . . . . . (4)
(If 4, go to 5E.)
walk, bike, or other . . . . . .(5)
(If 5, go to Question 6.)
don't read→ don't know . . . . . .(8)
(If 8, go to Question 6.)
refused . . . . . (9)
(If 9, go to Question 6.) [ ] 17

5D.1. Could you/they ride a bus or MARTA train to work? . . . . . [ ] 18
don't know(8) refused(9) yes(1) no(2)
(If no, go to Question 6.)

5D.2. Assuming today's bus and MARTA train fares remain the same, at what price per gallon of gasoline would you/they change to the bus or train? I'll read you some ranges. (Read only ranges 1 to 6.)

(1) less than $1.50
(2) $1.50 to $1.74
(3) $1.75 to $1.99
(4) $2.00 to $2.99
(5) $3.00 to $4.00
(6) over $4.00

don't read→ (7) never
(8) don't know
(9) refused

[ ] 19

(Go to Question 6.)

5E. Could you/they get to work in a car, truck, van or motorcycle? . . . . . don't know(8) refused(9) yes(1) no(2) [20]

6. So that your answers will influence the planning for your area, what is your address? (Residence address, not mailing address. Do not abbreviate except for Street Type and Sector. Use only 2-letter abbreviations such as CR, CT, DR, LN, RD, or ST for Street Types. Use only NE, NW, SE, and SW for Sector.)

Street Number 21-26

Street Name 27-49

Street Type 50-55 Sector

City 56-72

30 Zip Code 73-75

76-78

(If respondent refuses, ask for street names of nearest intersection. Do not code. If respondent refuses or does not know intersection, close survey and note on Call Record Card "2". Write intersection on line below.)

_____

1 (2)

7. How many cars, trucks, vans, and motorcycles are kept at your home for use by you or members of your household? . . . . . don't know(98) refused(99)
(If none, go to Question 9.) 9-10

8. For each vehicle, please give the following information:
(Read "For vehicle #1, what is the year, make, model, etc. . . . For vehicle #2, what is . . .) (If more than 8 cylinders/code "9". If don't know, mark "?", but do not code. If refused, mark "REF", but do not code.)

Vehicle number	Year	Make or manufacturer (write out, do not code)	Model (write out, do not code	# of cylinders	How many miles are on this vehicle (1,000's)	M.P.G. of fuel	company owned? yes(1) no(2)	
	19				000			
1								11-25
	19				000			
2								26-40
	19				000			
3								41-55
	19				000			
4								56-70
	19				000			
5								9-23
	19				000			
6								24-38

(3) 1

9. What is the combined total yearly income for everyone living in your home? I'll read some ranges; please tell me only the range number. (Read list slowly and include range number. Do not continue list after a response.)

(1) less than $5,000
(2) $5,000 to $9,999
(3) $10,000 to $14,999
(4) $15,000 to $24,999
(5) $25,000 to $34,999
(6) $35,000 to $49,999
(7) $50,000 and over
do not read → (8) don't know
(9) refused

39 [ ]

10. I'm going to read you several ways to conserve fuel. Please tell me if you have taken any of these actions in the past 2 years. Did you: (read list)

not applicable(7) don't know(8) refused(9) yes(1) no(2)

a. move your home closer to your work? . . . . . 40 [ ]
b. change jobs, so that your work is closer to your home? . . . . . 41 [ ]
c. car or van pool more often? . . . . . 42 [ ]
d. change your type of transportation? . . . . . 43 [ ]
e. shop closer to home? . . . . . 44 [ ]
f. plan social or recreational activities closer to home? . . . . . 45 [ ]
g. plan to combine several activities into one trip? . . . . . 46 [ ]
h. increase use of other forms of communication such as telephone and letters rather that transportation? . . . . . 47 [ ]
i. purchase a more gas efficient vehicle? . . . . . 48 [ ]
j. reduce the number of vehicles owned by your household? . . . . . 49 [ ]

11A. (Pick up on Screener.)

11B. We would like you to fill out the form on October/November _____. 50 [ ]
(If refused, code "9" here . . . . . .
and mark Call Record Card "1".)
A day or two later, we will have someone pick up your form. Will you please give me your name for mailing the form? _____.
(If refused, write "resident")
Is your mailing address the same as your residence? (Make sure you have an address in Question 6.) (If no, ask for mailing address.)

street or box _____.

city,state,zip _____GA_____.

11C. (Pick up on Screener.)

(HAVE YOU REMEMBERED TO CODE THE PHONE NUMBER ON PAGE 1?)

HOUSEHOLD MEMBER FORM

INSTRUCTIONS

This form is used to record all travel on one day by each member of your household. One person in your household should be given the responsibility of filling out this form. It should be filled out at the end of the day. Down the left side of the form are numbers that represent members of your household. You may write their names next to the numbers if this will help. The numbers across the top of the form represent the number of trips made by each household member, including children. A good way to fill out the form is to record all travel for person number one, then repeat for each member of the household.

- Household members are all persons who live in your home.
- A household member trip is the one-way travel for that person from one place to another place. Do not record children going out to play or trips made to a next door neighbor.
- An auto includes a car, truck, van or motorcycle.
- Boxes on form are for office use.
- Example

Household Member #1
From home to MARTA bus stop by car
From MARTA bus stop to work by bus
From work to MARTA bus stop by bus
etc.

Household Member #2
From home to school by walk
From school to home by auto
etc.

Household Member #3
From home to work by car
From work to lunch by car
From lunch to work by car
etc.

ATLANTA REGIONAL COMMISSION TRANSPORTATION STUDY
HOUSEHOLD MEMBER FORM

The information obtained survey will be confident will be used for transpo planning purposes only.

House hold Member Number	Where did this person begin the day (circle one)	Trip 1		Trip 2		Trip 3		Trip 4		Trip
		Where did this person go (circle one)	How did this person get there (circle one)	Where did this person go (circle one)	How did this person get there (circle one)	Where did this person go (circle one)	How did this person get there (circle one)	Where did this person go (circle one)	How did this person get there (circle one)	Where did this person go (circle one)
1	school shopping work home other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shoppi bus stop MARTA static other
2	school shopping work home other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work s home bus MAR o
3	school shopping work home other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school b bus/tra bike/ othe	
	school shopping work home	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shopping bus stop MARTA station other	auto school bus bus/train bike/walk other	work school home shoppir bus stop MARTA oth		
				school	auto	work schoo				

1. Office Use Only

2. Office Use Only

ATLANTA REGIONAL COMMISSION TRANSPORTATION STUDY
HOUSEHOLD VEHICLE FORM

The information obtained in this survey will be confidential. It will be used for transportation planning purposes only.

Make _____ Model _____ Year-19__ Tag # _____

Date to be completed 1__ - __-80.

Trip No.	Are you leaving home or going home? (circle one)	Number of people in vehicle including driver	Miles on vehicle	Time of day (circle AM or PM)	Where did you go? (circle one)	Was other transportation available? (circle best choice)	Did you pay for parking? (circle yes or no) If yes, how much?
1	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
2	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
3	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
4	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
5	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
6	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
7	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
8	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
9	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
10	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
11	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
12	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
13	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $
14	yes / no		Start / End	AM PM / AM PM	work home school shopping other	MARTA-train carpool walk bus other bike none	no / yes $

Miles on vehicle at end of day _____

Please record the total number of trips, including those on this form. __

Were any of the above trips to or from a bus stop or MARTA train station? (Circle yes or no.) yes / no

If yes, which trips were to or from a bus stop or MARTA train station? (Circle the trip numbers.)

1 2 3
4 5 6
7 8 9
10 11 12
13 14

ATLANTA REGIONAL COMMISSION
COMPANY-OWNED VEHICLE FORM

Make_____ Model_____ Year-19[ ][ ] Tag #-[ ][ ][ ][ ][ ][ ]

Date to be completed: [ ][ ]/[ ][ ]/[ ][ ]-80

Trip	Odometer Reading (mileage on vehicle)	Time of day (circle AM or PM)	Trip	Odometer Reading (mileage on vehicle)	Time of day (circle AM or PM)
1	Start	AM PM	13	Start	AM PM
	End	AM PM		End	AM PM
2	Start	AM PM	14	Start	AM PM
	End	AM PM		End	AM PM
3	Start	AM PM	15	Start	AM PM
	End	AM PM		End	AM PM
4	Start	AM PM	16	Start	AM PM
	End	AM PM		End	AM PM
5	Start	AM PM	17	Start	AM PM
	End	AM PM		End	AM PM
6	Start	AM PM	18	Start	AM PM
	End	AM PM		End	AM PM
7	Start	AM PM	19	Start	AM PM
	End	AM PM		End	AM PM
8	Start	AM PM	20	Start	AM PM
	End	AM PM		End	AM PM
9	Start	AM PM	21	Start	AM PM
	End	AM PM		End	AM PM
10	Start	AM PM	22	Start	AM PM
	End	AM PM		End	AM PM
11	Start	AM PM	23	Start	AM PM
	End	AM PM		End	AM PM
12	Start	AM PM	24	Start	AM PM
	End	AM PM		End	AM PM

Mileage at end of day [ ][ ][ ][ ][ ][ ]

Number of trips in excess of 24 [ ][ ]

The information obtained in this survey will be confidential. It will be used for transportation planning purposes only.

APPENDIX B

TABLE B-2

DISTRIBUTION OF SAMPLE BY WIRE CENTER

DESIRED DISTRIBUTION OF SAMPLE
BY CENSUS TRACTS

TRACT	PORTION	TRACT	PORTION	TRACT	PORTION
1.00	0.0030	2.00	0.0040	4.00	0.0020
5.00	0.0025	6.00	0.0011	7.00	0.0006
8.00	0.0018	9.00	0.0003	10.00	0.0006
11.00	0.0019	12.00	0.0042	13.00	0.0031
14.00	0.0013	15.00	0.0036	16.00	0.0011
17.00	0.0022	18.00	0.0018	19.00	0.0008
20.00	0.0011	21.00	0.0014	22.00	0.0018
23.00	0.0028	24.00	0.0025	25.00	0.0028
26.00	0.0015	27.00	0.0004	28.00	0.0017
29.00	0.0014	30.00	0.0016	31.00	0.0012
32.00	0.0011	33.00	0.0023	35.00	0.0005
36.00	0.0004	37.00	0.0009	38.00	0.0018
39.00	0.0020	40.00	0.0019	41.00	0.0017
42.00	0.0012	43.00	0.0010	44.00	0.0016
45.00	0.0005	46.00	0.0005	47.00	0.0006
48.00	0.0012	49.00	0.0008	50.00	0.0013
52.00	0.0024	53.00	0.0021	55.01	0.0018
55.02	0.0024	56.00	0.0013	57.00	0.0011
58.00	0.0012	59.00	0.0005	60.00	0.0025
61.00	0.0025	62.00	0.0012	63.00	0.0021
64.00	0.0014	65.00	0.0028	66.01	0.0016
66.02	0.0010	67.00	0.0032	68.00	0.0005
69.00	0.0022	70.00	0.0046	71.00	0.0023
72.00	0.0029	73.00	0.0037	74.00	0.0023
75.00	0.0028	76.01	0.0053	76.02	0.0017
77.01	0.0055	77.02	0.0042	78.01	0.0095
78.02	0.0028	79.00	0.0022	80.00	0.0033
81.01	0.0006	81.02	0.0043	82.01	0.0039
82.02	0.0019	83.01	0.0024	83.02	0.0025
84.00	0.0035	85.00	0.0035	86.01	0.0037
86.02	0.0020	87.01	0.0021	87.02	0.0023
88.00	0.0021	89.00	0.0077	90.00	0.0022
91.00	0.0065	92.00	0.0028	93.00	0.0043
94.00	0.0037	95.00	0.0043	96.00	0.0069
97.00	0.0017	98.00	0.0031	99.00	0.0022
100.00	0.0044	101.01	0.0055	101.02	0.0092
102.01	0.0062	102.02	0.0081	103.00	0.0052
104.00	0.0024	105.01	0.0089	105.02	0.0091
106.01	0.0027	106.02	0.0084	107.00	0.0026
108.00	0.0054	109.00	0.0006	110.00	0.0024
111.00	0.0021	112.01	0.0040	112.02	0.0035
113.01	0.0030	113.02	0.0094	114.00	0.0137
115.00	0.0026	116.00	0.0041	201.00	0.0009
202.00	0.0018	203.00	0.0023	204.00	0.0020
205.00	0.0025	206.00	0.0014	207.00	0.0018
208.00	0.0051	209.00	0.0045	211.00	0.0038
212.01	0.0114	212.02	0.0029	212.03	0.0045
212.04	0.0025	213.01	0.0010	213.02	0.0045
213.03	0.0025	213.04	0.0031	214.01	0.0043
214.02	0.0062	214.03	0.0047	214.04	0.0046
215.00	0.0067	216.01	0.0047	216.02	0.0022
216.03	0.0019	217.01	0.0054	217.02	0.0042
218.01	0.0099	218.02	0.0052	219.00	0.0118
220.00	0.0162	221.00	0.0023	222.00	0.0031
223.01	0.0040	223.02	0.0022	224.01	0.0029

DESIRED DISTRIBUTION OF SAMPLE
BY CENSUS TRACTS

TRACT	PORTION	TRACT	PORTION	TRACT	PORTION
224.02	0.0019	224.03	0.0026	225.00	0.0032
226.00	0.0042	227.00	0.0029	228.00	0.0016
229.00	0.0030	230.00	0.0009	231.01	0.0030
231.02	0.0019	231.03	0.0053	231.04	0.0058
232.00	0.0110	233.00	0.0073	234.01	0.0100
234.02	0.0144	235.01	0.0020	235.02	0.0042
235.03	0.0052	236.00	0.0052	237.00	0.0032
238.01	0.0026	238.02	0.0019	238.03	0.0030
301.00	0.0037	302.00	0.0104	303.00	0.0334
304.00	0.0153	305.00	0.0079	306.00	0.0031
307.00	0.0035	308.00	0.0034	309.00	0.0074
310.01	0.0041	310.02	0.0037	310.03	0.0055
311.01	0.0025	311.02	0.0050	311.03	0.0053
311.04	0.0094	312.00	0.0072	313.01	0.0037
313.02	0.0036	313.03	0.0092	314.00	0.0083
315.00	0.0056	401.00	0.0021	402.00	0.0050
403.01	0.0010	403.02	0.0035	403.03	0.0037
403.04	0.0030	403.05	0.0041	404.01	0.0063
404.02	0.0038	404.03	0.0040	404.04	0.0078
405.01	0.0155	405.02	0.0056	406.01	0.0107
406.02	0.0025	501.00	0.0064	502.00	0.0051
503.00	0.0117	504.00	0.0255	505.00	0.0147
506.00	0.0038	507.00	0.0136	601.00	0.0024
602.00	0.0032	603.00	0.0077	604.00	0.0042
801.00	0.0027	802.00	0.0050	803.00	0.0052
804.00	0.0030	805.00	0.0081	806.00	0.0030

APPENDIX B

TABLE B-1

DESIRED DISTRIBUTION BY CENSUS TRACT

DISTRIBUTION OF SAMPLE
BY WIRE CENTER

WIRE CENTER	PORTION	NUMBERS
1	0.0425	1147
2	0.0452	1219
3	0.0150	405
4	0.0386	1043
5	0.0223	601
6	0.0304	819
7	0.0364	982
8	0.0270	728
9	0.0156	419
10	0.0153	413
11	0.0176	475
12	0.0491	1324
13	0.0260	702
14	0.0151	407
15	0.0306	827
16	0.0301	812
17	0.0222	599
18	0.0262	706
19	0.0240	647
20	0.0125	338
21	0.0331	892
22	0.0277	748
23	0.0198	535
24	0.0166	448
25	0.0173	467
26	0.0243	655
27	0.0091	244
28	0.0143	386
29	0.0077	206
30	0.0088	237
31	0.0200	539
32	0.0135	365
33	0.0117	316
34	0.0152	409
35	0.0243	655
36	0.0344	928
37	0.0075	201
38	0.0097	262
39	0.0235	634
40	0.0073	195
41	0.0038	103
42	0.0103	277
43	0.0150	405
44	0.0102	274
45	0.0059	160
46	0.0081	218
47	0.0166	449
48	0.0	0
49	0.0038	103
50	0.0347	937
51	0.0	0
52	0.0025	68
53	0.0009	24
54	0.0	0
55	0.0006	16
56	0.0	0
57	0.0001	3

APPENDIX C

TABLE C-1

MANUFACTURER & VEHICLE CODES

Manufacturer	Model	Code
Alfa Romeo (01)	Alfetta	003
	Spider	001
AM General (02)	Post Office Vehicle	013
AMC (03)	Concord	004
	Concord Wagon	007
	Gremlin	003
	Matador Coupe	005
	Matador Sedan	006
	Matador Wagon	009
	Pacer	004
	Pacer Wagon	007
	Eagle	070
	Spirit	003
	Javelin	004
	Ambassador	004
	Rebel	004
	Hornet	004
	Hornet Wagon	007
Audi (04)	Fox	003
	Fox Wagon	007
	5000	004
	4000	003
	100LS	004
Austin Healy (50)	Marina	001
Aston Martin (95)		001
Avanti (5)	Avanti II	001
BMW (6)	320I	003
	530I	003
	2002	003
	2000	003
	1600	003
	128	003
	633	003
	733	004
	528/530/305	003
BMV (81)	Motorcycle	050
Brentwood (41)	Motorcycle	050
BSA (52)	Motorcycle	050

Manufacturer	Model	Code
Buick (07)	Century	005
	Century Wagon	008
	Electra	006
	Estate Wagon	009
	LeSabre	006
	Opel	003
	Apollo	004
	Regal	005
	Riviera	006
	Skyhawk	003
	Skylark	004
	Limited	005
	225	005
	5th Avenue	006
	Park Avenue	006
Cadillac (8)	Cadillac (CoupedeVille) (Fleetwood)	006
	Eldorado	005
	Limousine	006
	Seville	004
	DeVille/ Brougham	006
Checker (9)	Checker/ Marathon	005
	Marathon Wagon	008
Chevrolet (10)	Camaro	003
	Chevette	003
	Chevrolet (Impala/ Caprice)	006
	Chevrolet Wagon (Impala/ Caprice	009
	Corvette	001
	El Camino	011
	Luv	010
	Malibu	005
	Malibu Wagon	008
	Monte Carlo	005
	Chevelle	005
	Vega	003
	Belair	005
	Monza	003
	Monza Wagon	007

Manufacturer	Model	Code
Ford (15)	Courier	010
	Fairmont	005
	Fairmont Wag.	008
	Fiesta	003
	Ford (Fairlane/ Galaxy)	006
	Ford Wagon (County Squire) (Torino Wagon)	009
	Granada	004
	LTD II	005
	Mustang II	002
	Pickup (F100/ F150, F250, F350)	011
	Pinto	002
	Pinto Wagon	007
	Ranchero	011
	Thunderbird	005
	Van (Econoline/ Club Wagon	012
	Toring/Elite	006
	Falcon	004
	Maverick	003
	Bronco	070
	LTD	006
	LTD Wagon	009
	Mustang (Ghia)	003
	Escort	004
	Laser	003
	Custom	005
	Mainline(X-L)	005
	LTD II Wagon	008
GMC (16)	Caballero	011
	Pickup (C15, C25, K15, K25)	011
	Van (G15/G25, Sportvan	012
	C15 Jimmy (K15)	013
	C15 Suburban (C25, K15)	013
	Sprint	060
	Sierra	060
Harley-Davidson (42)	Motorcycles	050
Honda (17)	Accord	003
	Civic	002
	Civic Wagon	007
	Prelude	002
	Hawk	050
International Harvester (36)	Scout II (SSII)	013
	Terra Pickup	011
	Traveler	013
Imperial (94)	Imperial	005
Jaguar (53)	XKE/XJ12/XJS	001
Jeep (18)	Jeep (CJ-6/CJ-7, CJ-5, CJ-8)	060
	Cherokee/ Wagoner	013
	J10/J20 Pickup	011
Kawasaki (38)	Motorcycle	050
KTM (92)	Motorcycle	050
Lamborighini (91)	Urraco	001
Lancia (93)	Beta/Zagato	003
Lincoln-Mercury (19)	Bobcat	002
	Bobcat Wagon	007
	Continental Mark V	005
	Cougar/Cougar XR-7	005
	Lincoln Conti- nental Mark VI	006
	Mercury (Montego/ Marquis)	006
	Mercury Wagon (Marquis)	009
	Monarch	004
	Versailles	004
	Zephyr	005
	Zephyr Wagon	008
	Comet	004
	Capri	003
	Lynx	004
	Colony Park	005
	Cougar Wagon	008

Manufacturer	Model	Code
Chevrolet	Nova	004
	Pickup (C10) (C20)(C20) (K10)(K20)	011
	Van (Spartan)	012
	Citation	005
	C10 Blazer (K10)	070
	C10 Suburban (C20)(K10)	013
	Corvair	003
	Bonanza	011
	Vega Wagon	007
Chrysler	Chrysler (New Yorker/New Port	006
(11)	Imperial	006
	Cordoba	005
	Lebaron	005
	Lebaron Wagon	008
	Semca	004
	300-L	006
	Signet	005
Citroen (90)		004
Datsun (12)	B-210	002
	F-10	003
	F-10 Wagon	007
	Pickup	010
	710/610 Wagon	007
	200SX	002
	280Z	001
	510	003
	510 Wagon	007
	810	003
	810 Wagon	007
	610	004
	710	004
	1200	003
	310	003
	B-110	002
Dodge (13)	Aspen	004
	Aspen Wagon	008
	Celeste	002
	Challenger	002
	Charger (SE/ Magnum XE)	005

Manufacturer	Model	Code
Dodge (cont.)		
	Colt	002
	Colt Wagon	007
	Diplomat	005
	Diplomat Wagon	008
	Monaco	005
	Monaco Wagon	008
	Omni/DeTomaso	004
	Pickup (D150/ D200/W150/ W200)	011
	Van (Sports-man)	012
	Coronet	005
	Dart	004
	Royal Monaco	006
	Royal Monaco Wagon	009
	Demon	004
	Magnum	006
	Ramcharger	013
	D-50 Pickup	010
	Mirada	005
	St. Regis	006
	Aries	005
	Aries Wagon	008
	B150/B250 Wagon	012
	Custom 880	006
	Rambler	004
	Coronet Wagon	008
Fiat (14)	Lancia Beta	003
	Lancia Beta Scorpion	001
	X1/9	001
	124 Sport	001
	126	002
	126 Wagon	007
	131 Mirafioni	003
	131 Estate Wagon	007
	Brava	003
	Brava Wagon	007
	Spider 2000	001
	Strada	004
	128 Sedan	004
	128 Wagon	008

Manufacturer	Model	Code
Mazda (20)	808	003
	808 Wagon	007
	B1800 Pickup (B2000)	010
	Cosmo	003
	GLC	003
	RX-3	002
	RX-4	003
	RX-4 Wagon	007
	GLC Wagon	007
	RX-7	001
	626	003
Mercedes (21)	MB116 (280/280C)	004
	MB123 (230)	004
	MB107 (450SL/SLC)	001
	MB 116V (450 SE/SEL)	005
	SD/220	004
	340D/300D	004
	250D	004
	240D	004
MG (22)	MGB	001
	Midget	001
	MGA	001
Nash (83)	Metropolitan	003
Mitsubishi	(see Plymouth or Dodge for model)	
Oldsmobile	Vista Cruiser Wagon	008
	Custom Cruiser Wagon	009
	Cutlass (Supreme)	005
	Cutlass Cruiser Wagon	008
	Delta 88	006
	Oldsmobile 98	006
	Omega	004
	Starfire	003
	Toronado	006
Peugeot (24)	504	004
	504 Wagon	008
	604	004

Manufacturer	Model	Code
Plymouth (25)	Arrow	002
	Fury	005
	Fury Wagon	008
	Horrison/Turismo)	004
	Lancer	002
	Lancer Wagon	007
	Sapporo	002
	Van (Voyager) (B150/B250/B350)	012
	Volare	004
	Volare Wagon	008
	Duster/Valiant	005
	Satellite/Road Runner	005
	Barracuda	004
	Gran Fury Wagon	009
	Champ	003
	Gran Fury	006
	Trailduster	013
	Fargo (D150/D250, W150/W250)	011
	Reliant	005
	Reliant Wagon	008
	TC3/Tarismo	003
	Arrow Pickup	010
	Savoy	005
	Gran Coupe	005
	Cricket	003
	Cricket Wagon	007
Pontiac (26)	Firebird (Trans Am)	003
	Grand Prix	005
	Lemans/GrandAm	005
	Lemans Safari Wagon	008
	Phoenix	004
	Pontiac Bonneville/Catalina)	006
	Pontiac Safari Wagon (Bonneville/Catalina)	009
	Sunbird	003
	Sunbird Safari Wagon	007
	Tempest	006
	Astre	003
	Ventura	004
	Grandville	006

Manufacturer	Model	Code
Pontiac (cont.)		
	Firechief	006
	Astre Safari Wagon	007
Porsche (27)	Turbo Carera	001
	911 (S)	001
	924	001
	928	002
Renault (28)	LeCar	002
	17 Gordini	002
	181	003
	181 Wagon	007
Rolls-Royce/ Bentley (29)	Camarque	004
	Rolls-Royce/ Bentley	004
Saab (30)	99	004
Studebaker (82)	Cruiser	004
Subaru (31)	Subaru	002
	Subaru Wagon	007
	Brat	013
Sazuki (37)	Motorcycles	050
	Subaru Wagon	007
	Brat	013
Sazuki (37)	Motorcycles	050
	LJ80 (V)	013
	LJ81 Pickup	010
Toyota (32)	Celica (Supra)	003
	Corolla (Tercel)	003
	Corolla Wagon	007
	Corona	003
	Corona Wagon	007
	Cressida	003
	Cressida Wagon	007
	Hilux	010
	Land Cruiser	013
	Land Cruiser Wagon	013
	Tercel	003
	Starlet	002
	3/4 Ton Pick-up	011
Truimph (33)	Spitfire	001
	TR	001
Volkswagon (34)	Beetle (Convertible/ Thing	002
	Bus (Wagon, Kombi, Campmobile)	012
	Dasher	003
	Dasher Wagon	007
	Rabbit	003
	Scirocco	007
	Pickup	010
	Jetta	003
Willys (51)	Jeep	060
Yamaha (39)	Motorcycles	050
Volvo (35)	240	004
	245 Wagon	007
	160	004

APPENDIX C

TABLE C-2

CODING STANDARDS

Coding Standards
Telephone Questionnaire

- Telephone number - Make sure phone number written on questionnaire is the same as that printed on attached call record card.

1. Make sure valid code (1-7) is entered. If not, then questionnaire must be rejected as "refused" (remark call record card).

2.-4. Make sure these are filled in.

5A., 5B. Make sure valid code is entered (1,2,8,9). If either is "1", make sure 5C is filled in.

5C. Make sure valid code (1-5,8,9) is entered. If 1 or 2 is entered, make sure 5.D.1 is answered. If 3 or 4 is entered, make sure 5.E is answered.

5.D.1. Make sure valid code (1,2,8,9) is entered. If "1" is entered, make sure 5.D.2 is answered.

5.D.2. Should only be answered if 5C is "1" or "2" and if 5.D.1 is "1".

5.E. Should only be answered if 5C is "3" or "4". Make sure valid code (1,2,8, 9) is entered.

6. Address standards are fairly strict. Address should consist of a street number, street name, sector, city, and zip code. If any item is missing, try to locate it:

- Use city or suburban directory to locate by phone number if possible.
- If name is given, try to look up in phone book.
- Zip codes can be looked up in Zip Code Directory.

NOTE: If an apartment number appears after the street name, it should be removed from address section and entered on last page.

Street type should be abbreviated as follows:

Street - ST	Place - PL	Avenue - AV
Road - RD	Highway - HW or HY	Trace - TC
Drive - DR	Trail - TR or TL	Terrace - TE
Boulevard - BL	Way - WY	Lane - LA or LN
Circle - CR	Court - CT	

If only an intersection is given, code "INT" in the 3 blocks below zip code. Try to locate the address of some establishment at this intersection and code it in for address.

If this question was refused altogether, the questionnaire should be rejected as "refused" and the call record card marked.

7. Check to see that information is given under Question 8 for all vehicles reported up to 6.

8. The following standards apply:

- Year - Year of car; 98 = don't know; 99 = refused.
- Make or manufacturer - See codes in attachment to TM#2750-6; 98 = don't know; 99 = refused.
- Model - See codes in attachment to TM#2750-6; 098 = don't know; 099 = refused.
- Number of cylinders - 9 = over 8; R = refused; ? = don't know; M = rotary engine (Mazda)
- Miles on vehicle - -1 = don't know; -2 = refused.
- MPG of fuel - -1 = don't know; -2 = refused; 99 = 99 or more.
- Company owned? - Check for code of 1 or 2; 9 = refused.

If there are less entries than vehicles reported in Question 7, fill in refusal codes for all items for the missing vehicles.

9. Make sure it is answered.

10. Check for valid codes (1,2,7,8,9).

Coding Standards
Call Record Card

Check to make sure that telephone number is legible on card; if not, write it in. Check with attached questionnaire to see that questionnaire result is consistent with code on card. Each line represented a call made to the number. All lines which are filled in should be coded. The items are coded as follows:

- Date - MMDD, i.e., 1101 = November 1
- Time - HHMM, i.e., 300 = 3:00 (either AM or PM, military time will not be used).
- Interviewer - Use 2-digit codes listed in Appendix.
- Check to see that one of the 2-digit disposition codes is circled.

All items entered by coder should be entered in red pen and circled in red over the pencil entries. The pencil entries should be erased.

Appendix to Attachment B

Interviewer's Initials & Codes

AB	38	DY	48	SB	67	EOP	09
AH	18	EH	61	SC	28		
AJ (Day)	15	FR	53	SDC	19		
AJ (Nite)	74	GG	42	SGB	17		
AL	22	HB	14	SM	62		
AW	13	IR	71	SP	54		
BC	47	JB	59	TB	36		
BF	57	JC	73	TC	40		
BH	51	JK	65	TG	76		
BJ	12	JM	31	TH	44		
BJH	16	JO	58	TS	41		
BJJ	22	JV	30	VAC	29		
BS (Day)	50	KJ	26	VC	25		
BS (Nite)	75	KOB	49	VM	69		
BW (Day)	46	LJ	78	VW	32		
BW (Nite)	64	LT	33	WS	70		
CB	56	LW	34	DC	01		
CH	35	MC	39	JTC	02		
CR	24	MDJ	23	KR	03 (81)		
CS	80	MN	20	TMC	04		
CW	55	MW	43	LR	82		
DF	37	NF	21	RR	84		
DG	52	PG	45	LBT	85		
DSL	11 (83)	PR	27	HH	05		
DS	77	RM	68	TJ	06		
DSH	60	RP	66	JRK	07		
DT	79	RW	63	LP	08		

Coding Standards
Personal Travel Form

There are 4 basic coding items on this form, which are to be coded as follows:

- Where did this person begin the day? (One response for each household member traveling.)

  School = 1
  Shopping = 2
  Work = 3
  Home = 4
  Other = 5
  No response = blank or 0

  Note that in the vast majority of cases this should be "home". However, it could be otherwise.

  Also, some respondents with a member making over 8 trips continued the pattern on another line. This is OK; the first line should have "8" under number of trips. The continuation line should have the person "starting the day" at the last destination type on the original line.

- Where did this person go?

Work	= 1	Other	= 5
Home	= 2	School	= 6
Bus stop	= 3	Shopping	= 7
MARTA Station	= 4	No response	= blank or 0

  NOTE: If 2 destinations are circled and 1 is home, the trip should be split. If it appeared to start at home, then the first trip should be the other one. If there are 2 non-home destinations, take them in order of code.

- How did this person get there?

  Auto = 1
  School bus = 2
  Bus/Train = 3
  Bike/Walk = 4
  Other = 5
  No response = blank or 0

  NOTE: Some people have circled just the word "bus" on the "school bus" line. This should be treated as "bus/train" and coded "3".

- Total number of trips.

  Check to be sure this agrees with number of trips recorded on line.

In general, the following should be observed:

- Forms which cannot be resolved easily should be rejected unless the problem pertains to only a few of the trips.

- In general, household members with 8 or less trips should end at home. In all cases where the last trip is to "school" or "shopping" and in most cases where the last trip is to "work", special attention is called for. Auto trips of this kind should be correlated with trips on the vehicle form for resolution. If the vehicle form is corrected as detailed in Attachment D to add or split the trip to bring the person back home, then the travel form should be adjusted also. An evening trip to work indicates a night shift worker, who should not return before midnight.

- There will be cases where editing of the vehicle forms cause you to doubt whether all household members are recorded. An example is where the travel form has 2 people making trips, but the vehicle forms indicate they are also taking someone to school. In this case the form should be marked "Are there school children not reported?" and put aside for possible calling if the form is otherwise OK.

- A blank form should only be accepted as is if there is some positive evidence (a note attached) that there really was no tripmaking. Otherwise, travel should be reconstructed from vehicle forms as long as it is apparent that only household members traveled in the vehicle. Examples would be trips with only 1 person in vehicle or where it is obvious which people in the vehicle are household members. Forms reconstructed in this fashion should be marked "Travel from vehicle forms" and put aside for a possible call to confirm that this was all the travel. If there is origin-destination data on a blank form, it should be considered <u>invalid</u>.

- Some people have interpreted the coding boxes as a place to check "other". This would be evident if the only place the box is marked is where no response is circled. In these cases, white-out the mark and code "other".

- Some people have entered data for more than one day. This will usually be apparent. Select only the data for the day assigned (or the first day listed, if unknown) and recode.

- Forms without origin-destination data should be set aside for a phone call to get the data.

This covers a lot of the problems which have so far been encountered or anticipated. In general, trip patterns should be checked for consistency and reasonableness. Also they should be consistent with vehicle trips reported.

Other problems should be reported to Jim Marks for consideration.

Coding Standards
Household Vehicle Form

The items at the top of this form are coded as follows:

- Telephone number - Make sure it agrees with other forms for household. Also the number in the square below stands for the vehicle number. These should be different for different vehicles from a household. For example, if 3 forms are returned from a household, they should be numbered "1", "2", "3".

- Make - Coded in accordance with codes used in telephone questionnaire (see attachment to TMA-2750-6). 99 = refused (if left blank).

- Model - Handle similarly to Make.

- Year - Year of vehicle; 99 = refused (blank).

- Tag # = Be sure it is legible; leave blank if not entered.

A blank form should only be accepted if there is positive evidence (a note) that the vehicle was not used. Code heading and enter "00" for total number of trips.

The trip-by-trip items are coded as follows:

- Are you leaving home or going home?

  Yes = 1 No = 2

NOTE: This item should be changed to be consistent with trip pattern. An exception would be where the trip pattern may be in error. For example, a "work-other" pattern with "yes-yes" circled would be corrected to "yes-no" unless the items entered indicated that these 2 trips are actually round trips (4 one-way trips). In this case the trips should be split.

- Number of people in car.

  0 = no response

NOTE: If left blank, try to logically determine what the value should be from other sources.

- Miles on vehicle.

  -1 = no response

NOTE: Something should be entered. A form with no mileages should be rejected. However, if some of the trip lengths can be determined, then code the form.

NOTE: Some people will just report distances. Convert these into an odometer sequence starting at 0.

- Time of day.

  No -response = blank

NOTE: This item can sometimes be used to find round trips entered as 1 trip. For example, a shopping trip of 3 miles with start time of 7:00 PM and end time of 9:30 PM should be 2 trips of 1.5 miles since it would not take this long to go that distance.

NOTE: This item can be used to confirm reports of household members not ending the day at home.

NOTE: This item can be used to identify forms containing more than 24 hours of travel. Some people will work at night and will not start recording when they come home. Instead, they will start during the middle of the day (probably when they get up) and continue for 24 hours. This is OK. However, if several days of travel are recorded, then only the selected day should be left on the form. If only overall travel (no trip detail) is recorded for each day, the form should be rejected.

NOTE: Be sure either AM or PM is circled for all times, even those which are nonresponse.

- Where did you go?

Work	= 1	Shopping	= 4
Home	= 2	Other	= 5
School	= 3	No response	= blank or 0

Be sure the trip pattern is logical. Also, in most cases the vehicle should end at home. However, the same guidelines should be followed as in Attachment C. See above for instances where trips should be split.

- Was other transportation available?

MARTA train	= 1	Bike	= 5
Carpool	= 2	Other	= 6
Walk	= 3	None	= 7
Bus	= 4	No response	= 9 or 0

- Did you pay for parking?

  Enter "-1" for no response
  For "no" enter "000"
  If a periodic rate is given, divide down to the day; use 20 days per month and 240 days per year. If value is less than $0.01, enter "001".

Items at bottom:

- Miles on vehicle at end of day - Enter last mileage, if not already entered.

NOTE: Some people enter the number of miles driven during the day; this should be changed.

- Total number of trips - Make sure it is consistent with trips recorded.

- Were any trips to or from a bus stop or MARTA station?

Code "1" in corresponding boxes. In other words, if 2 and 3 and 6 and 7 are circled, the first seven boxes should have:

0110011 (note: blank can be used for 0)

When splitting a trip, use the start time as the start time on the first trip and the end time as the end time on the second trip.

If a form requires a good deal of correction, it is probably better to get a blank and recopy it. In this case, the old form should be disposed. Contact Jim Marks for resolution of other problems.

Coding Standards
Company-owned Vehicle Form

This form should be handled in a similar manner as the Household Vehicle Form, except that there is less data. Trips will normally not be split on this form since not enough is known about the travel. Again, forms without any of the mileages should be rejected. If only one or two mileages are missing, they should be coded -1 as on the Household Vehicle Form (Attachment D). Be sure that AM or PM is circled on time. Times not entered should be left blank.

NOTE: At end of form, record number of trips in excess of 24, not total trips.

APPENDIX C

TABLE C-3

TAPE FILE FORMAT

Tape GT2750 (Standard labels)
1600 BPI

File 1 - 'PHONE.SURVEYS'
LRECL = 182, BLKSIZE = 1820

Contains 5929 telephone questionnaire forms
Data format:

Column	Type	Item	
1-7	integer	Telephone number	-
8	integer	County code	1=Clayton 2=Cobb 3=DeKalb 4=Douglas 5=Fulton 6=Gwinnett 7=Rockdale
9	integer	Number of phone numbers for HH	1-6 7=7 or more 8=don't know 9=refused
10-11	integer	Number of persons in HH	98=don't know 99=refused
12-13	integer	Number of licensed drivers in HH	98=don't know 99=refused
14	integer	Do you (respondent) work outside HH	1=yes 2=no 8=don't know 9=refused
15	integer	Does someone else work outside HH (only answered if col.14=1)	1=yes 2=no 8=don't know 9=refused
16	integer	Mode to work of this person	1=drive alone 2=car or van pool 3=bus 4=MARTA train 5=walk,bike,other 8=don't know 9=refused
17	integer	Could person use MARTA? (only if col. 16=1,2)	1=yes 2=no 8=don't know 9=refused

18	integer	At what price of gas would change to bus or train (only if col. 17=1)	1=$1.50 or less 2=$1.50-$1.74 3=$1.75-$1.99 4=$2.00-$2.99 5=$3.00-$4.00 6=more than $4.00 7=never 8=don't know 9=refused
19	integer	Could person get to work by auto (only if col. 16=3,4)	1=yes 2=no 8=don't know 9=refused
20-24	integer	Street number	-
26-48	alpha.	Street name	
50-51	alpha.	Street type	
53-54	alpha.	Sector	NW,NE,SE,SW
56-70	alpha.	City	
72-74	integer	Last 3 digits of zip code	
75-77	alpha.	Coded "INT" if only nearest intersection given	
78-79	integer	Vehicle ownership for household	98=don't know 99=refused

The following fields repeat for each of six vehicles:

80,95,110, 125,140,155		Vehicle number	1-6
81-82,96-97, 111-112,126-127, 141-142,156-157		Model year	98=don't know 99=refused
83-84,98-99, 113-114,128-129, 143-144,158-159		Manufacturer code (see list)	98=don't know 99=refused
85-87, 100-102,115-117, 130-132,145-147, 160-162	integer	Vehicle size code (see list)	098=don't know 099=refused
88,103, 118,133, 148,163	alpha.	Number of cylinders	1-8 9=9 or more M=rotary engine ?=don't know R=refused

89-91, 104-106, 119-121, 134-136, 149-151, 164-166,	integer	Miles on vehicle (000's)	-1=don't know -2=refused
92-93, 107-108, 122-123, 137-138, 152-153, 167-168	integer	MPG	-1=don't know -2=refused
94, 109, 124, 139, 154, 169	integer	Is vehicle company owned?	1=yes 2=no
170	integer	Income for household	1=less than $5,000 2=$5000 - 9999 3=$10000-14999 4=$15000-24999 5=$25000-34999 6=$35000-49999 7=$50000 and over 8=don't know 9=refused

The next set of questions deals with conservation measures by respondents taken in last 2 years:
Codes for all: 1=yes 2=no 7=not applicable
8=don't know 9=refused

171	integer	Move home closer to work
172	integer	Change jobs to be closer to home
173	integer	Car or van pool
174	integer	Changed mode
175	integer	Shop closer to home
176	integer	Plan activities closer to home
177	integer	Combine activities into one trip
178	integer	Use telephone or letters instead of transportation
179	integer	Purchase a more gas efficient vehicle
180	integer	Reduce number of vehicles
181	integer	Coded "9" if respondent refused mailout

These records can be read by the following FORTRAN statements:

```
      READ( ,1)PHONE,COUNTY,NPHONES,NPERS,NDRIVE,
     .WORKOUT,WRKOUT2,MODE,MARTA,CHANGE,AUTO,
     .STRNO,(STRNAME(I),I=1,23),STRTYPE,SECTOR,(CITY(I), I=1,15),ZIP,INT,
     .(VEHNO(I),YEAR(I),MANCODE(I),SZECODE(I),CYL(I),MILES(I),
     .MPG(I),COMP(I),I-1,6),INCOME,(ENERGY(I),I=1,10),
     .REFMAIL
    1 FORMAT(I7,2I1,2I2,6I1,I5,1X,23A1,1X,A2,1X,A2,1X,
      15A1,1X,I3,A3,I2,6(I1,2I2,I3,A1,I3,I2,I1),12I1)
```

Where:

PHONE=telephone number
COUNTY=county of residence
NPHONES=number of phone numbers in household
NPERS=number of people in HH
NDRIVE=number of licensed drivers in HH
WORKOUT=does respondent work outside home
WRKOUT2=does someone else work outside home
MODE=mode to work
MARTA=could person use MARTA
CHANGE=at what gas price person would change
AUTO=could person use auto
STRNO=street number
STRNAME=street name (stored letter-by-letter)
SECTOR=sector of city
CITY=city name (stored letter-by-letter)
ZIP=zip code
INT=int. code
VEHNO(I)=vehicle number I
YEAR(I)=year of vehicle I
MANCODE(I)=manufacturer code for vehicle I
SZECODE(I)=size code for vehicle I
CYL(I)=number of cylinders for vehicle I
MILES(I)=miles on vehicle I
MPG(I)=gasoline mileage for vehicle I
COMP(I)=is vehicle I company-owned?
INCOME=household income
ENERGY(I)=response to energy question I
REFMAIL=did respondent refuse mailout?

File 2 - 'HH.MEMBER.FORMS'
LRECL=178,BLKSIZE=1780

Contains 1118 household member forms
Data format:

Col. 1-7	Phone number	integer	
Col. 8-10	Date (MDD, i.e. 029 = 10-29 or Oct. 29)		
	8 rows, 1 for each household member, follow in the form:		
	Member number	integer	1-8
	Where person started day	integer	1=school 2=shopping 3=work 4=home 5=other
	Where did person go on 1st trip	integer	1=work 2=home 3=bus stop 4=MARTA station 5=other 6=school 7=shopping
	How did person get there	integer	1=auto 2=school bus 3=bus/train 4=bike/walk 5=other

This pattern continues for 8 trips; after this, the number of trips is recorded.

The data can be read as follows:

```
      READ( ,1)PHONE,DATE,(MEMB(I),START(I),(PURP(I,J),MODE(I,J),
      J=1,8),NTRIPS(I),I=1,8)
    1 FORMAT(I7,I3,8(18I1,I3))
```

where
PHONE=phone number
DATE=completion date
MEMB(I)=member number I
START(I)=start of day location for member I
PURP(I,J)=trip purpose (where they went) for member I, trip J
MODE(I,J)=travel mode for member I, trip J
NTRIPS(I)=total number of trips made by member I

File 3 - 'HH.VEHICLE.FORMS'
LRECL = 440, BLKSIZE = 4400

Contains 2849 household vehicle forms
Data format:

1-7	Phone number	integer	
8-9	Vehicle number for HH	integer	
11-12	Manufacturer code (see list)	integer	98 = don't know 99=refused
13-15	Size code (see list)	integer	098 = don't know 099 = refused
16-17	Year	integer	98 = don't know 99 = refused
18-23	Tag number	alpha.	blank = refused
24-26	Date	integer	

Trip information for 14 trips followed, each trip in this order:

I1	Leaving or coming home?	integer	1 = yes 2 = no
I2	Number of people in vehicle	integer	0 = refused
F6.1	Start mileage	real	-1 = refused
F4.2	Start time (HH.MM)	real	0 = refused
F6.1	End mileage	real	-1 = refused
F4.2	End time (HH.MM)	real	0 = refused
I1	Trip purpose	integer	1 = work 2 = home 3 = school 4 = shopping 5 = other
I1	Alternate transportation available	integer	1 = MARTA-train 2 = carpool 3 = walk 4 = bus 5 = bike 6 = other 7 = none
F3.2	Cost of parking ($_._)	real	0 = none -1 = refused

After the trip data is the following:

419-424	Miles on vehicle at end of day	real (F6.1)	-1 = refused
425-426	Total number of trips	integer	-1 = refused
Cols. 427-440	If any of the 14 trips was to or from a MARTA station, a "1" should be found in the corresponding position.		

The following FORTRAN statements could read this file:

```
      READ( ,1)PHONE,SEQ,MANCODE,SZECODE,YEAR,(TAG(I),
     .I=1,2),DATE,(TOFROM(I),OCC(I),STMILE(I),STTIME(I),
     .ENDMILE(I),ENDTIME(I),PURP(I),ALTRANS(I),PARK(I),I=1,14),
     .EODMILE,TRIPS,(MARTA(I),I=1,14)
    1 FORMAT (I7,I2,1X,I2,I3,I2,2A3,I3,6(I1,I2,
     .2(F6.1,F4.2),2I1,F3.2),F6.1,I2,14I1)
```

PHONE=phone number
SEQ=vehicle sequence within household
MANCODE=manufacturer code (see list)
SZECODE=size code
YEAR=year
TAG=tag number (stored in 2 parts)
DATE=date
TOFROM(I)=was trip I to/from home?
OCC(I)=number of people in vehicle for trip I
STMILE(I)=start mileage, trip I
STTIME(I)=start time, trip I
ENDMILE(I)=end mileage, trip I
ENDTIME(I)=end time, trip I
PURP(I)=trip purpose, trip I
ALTRANS(I)=alternate transportation, trip I
PARK(I)=parking cost, trip I
EODMILE=end of day mileage
TRIPS=total number of trips
MARTA(I)=was trip I to/from a MARTA station?

File 4 - 'COMP.VEHICLE.FORM'
LRECL = 512, BLKSIZE = 5120

Contains 125 company-owned vehicle forms

Data format:

Col. 1-7	Phone number	integer	
Col. 8-9	Manufacturer Code (see list)	integer	99 = refused
Col. 10-12	Size code (see list)	integer	099 = refused
Col. 13-14	Year	integer	99 = refused
Col. 15-20	Tag number	alpha.	
Col. 21-23	Date	integer	

Next comes the data for 24 trips, as follows:

F6.1	Start mileage	real	-1 = refused
F4.2	Start time	real	0 = refused
F6.1	End mileage	real	-1 = refused
F4.2	End time	real	0 = refused
Col.504-509	End of day mileage	real(F6.1)	-1 = refused
Col. 510-511	Number of trips in excess of 14	integer	

The following FORTRAN statements can read the data:

```
      READ( ,1) PHONE,MANCODE,SZECODE,YEAR,(TAG(I),I=1,2),
     .DATE,(STMILE(I),STTIME(I),ENDMI(I),ENDTIME(I),I=1,24),
     .EODMILE,EXTRIPS
    1 FORMAT(I7,I2,I3,I2,2A3,I3,48(F6.1,F4.2),
     .F6.1,I2)
```

EXTRIPS = trips in excess of 24
See file 3 format for other variables.

File 5 - 'CALL RECORD.CARDS'
LRECL = 60, BLKSIZE = 6000

Contains 19475 call record cards

Data format:

Col. 1-7	Phone number	
	Data for up to four calls follows:	
I4	Date (MMDD)	
I1	Day of week (these codes should not be relied on, instead classify by date)	1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday
I4	Time (HHMM)	
I2	Interviewer code	
I2	Disposition code	1 = completed interview 2 = refused 3 = outside area 4 = language problem 5 = terminated 6 = no answer 7 = call back 8 = busy 9 = non-working 10 - business 11 = institution 12 = other

The following FORTRAN can be used to read the data:

```
      READ( ,1)PHONE,(DATE(I),DOW(I),TIME(I),INT(I),DISP(I),
      I=1,4)
    1 FORMAT (I7,4(I4,I1,I4,2I2))
```

PHONE=phone number
DATE(I)=date of call I
DOW(I) = day of week for call I
TIME(I)=time for call I
INT(I)=interviewer making call I
DISP(I)=disposition for call I

File 6 - 'OD.DATA'
LRECL = 80, BLKSIZE = 8000

Contains origin-destination subsample data, 2 records for each O-D pair.

Data format:

Col	
1-7	Phone number
9	Trip number (0 or 1 = first trip, 2 = second trip)
11	Origin/destination (1=origin, 2=destination)
13	Purpose (see codes from household member form; 0 = not known)
17-80	Address

File 7 - 'MAILOUT LOG'
LRECL = 80

Log of mailouts 5025 records:

Data items:

Col	
1-7	Phone number I7
8	Number of household vehicle forms Sent I1
9	Number of company-owned vehicle forms sent I1
10-13	Mailout date I4
14-17	Reminder date I4
18-21	Fillout date I4

File 8 - 'MEMBER SUMMARY'
LRECL = 163 BLKSIZE = 9454

Summary of household member forms - contains 1118 records

Data Items:

Col	
1-7	Phone Number I7
8-11	Date I4
12-14	HB Work Trips-Auto I3
15-17	NHB Auto I3
18-20	Auto to Bus Stop I3
21-23	Auto to MARTA rail station I3
24-26	HB Other Auto I3
27-29	HB School Auto I3
30-32	HB Shopping Auto I3
33-35	HB Work School Bus I3
	HB Work Bus-Train I3
	HB Work Bike-Walk I3
	HB Work Other Mode I3
	County I1
	Household Size I2
	License Drivers I2

File 9 - 'HHVEH SUMMARY '
LRECL = 180 BLKSIZE = 9360

Summary of household vehicle forms - contains 2849 records:

Co.	
1-7	Phone I7
10-11	Make (codes as on tel. quest.) I2
12-14	Model (codes as on tel. quest.) I3
15-18	Year I4
19-22	Date I4
(1)	HB Work Trips I2
(2)	NH Based I2
(3)	HB School I2
(4)	HB Shopping I2
(5)	HB Other I2
(6)	Undetermined I2
1.	For which veh-miles not avail. I2
2.	For which veh-miles not avail. I2
3.	For which veh-miles not avail. I2
4.	For which veh-miles not avail. I2
5.	For which veh-miles not avail. I2
6.	For which veh-miles not avail. I2
1.	For which per-miles and VM not avail. I2
2.	For which per-miles and VM not avail. I2
3.	For which per-miles and VM not avail. I2
4.	For which per-miles and VM not avail. I2
5.	For which per-miles and VM not avail. I2
6.	For which per-miles and VM not avail. I2

1.	For which parking cost not available	I2
2.	For which parking cost not available	I2
3.	For which parking cost not available	I2
4.	For which parking cost not available	I2
5.	For which parking cost not available	I2
6.	For which parking cost not available	I2

Veh-Miles	HB Work	F5.1
Veh-Miles	NHB	F5.1
Veh-Miles	HB School	F5.1
Veh-Miles	HB Shopping	F5.1
Veh-Miles	HB Other	F5.1
Veh-Miles	Undetermined	F5.1

Person-Miles	HB Work	F6.1
Person-Miles	NHB	F6.1
Person-Miles	HB School	F6.1
Person-Miles	HB Shopping	F6.1
Person-Miles	HB Other	F6.1
Person-Miles	Undetermined	F6.1

Parking Cost	HB Work	F5.2
Parking Cost	NHB	F5.2
Parking Cost	HB School	F5.2
Parking Cost	HB Shopping	F5.2
Parking Cost	HB Other	F5.2
Parking Cost	Undetermined	F5.2

Total Vehicle-Miles	F6.1
County (codes as on tel. quest.)	I1
Household Size	I2
Vehicles	I2
Income (codes)	I1

A-2750

ARC TRANSPORTATION STUDY QUESTIONNAIRE (1) Phone# 2-8 [ ][ ][ ] [ ][ ][ ][ ]

Since your home is within the area of interest to the Atlanta Regional Commission, your responses to this survey are very important to the transportation planning of your community.

1. What county are you in? . . . . . Clayton . (1)
Cobb . . .(2)
DeKalb . .(3)
Douglas . (4)
Fulton . .(5)
Gwinnett .(6)
Rockdale .(7)
[ ] 9

2. How many phone numbers does your household have? . . . . . [ ] 10
don't know(8) refused(9) seven or more(7)

3. Including yourself, how many people live in your home? . . . . . [ ][ ] 11-12
don't know(98) refused(99)

4. Including yourself, how many licensed drivers live in your home? . . . . . [ ][ ] 13-14
don't know(98) refused(99)

5A. Do you work outside the home? . . . . don't know(8) refused(9) yes(1) no(2) [ ] 15
(If yes, go to 5C.)

5B. Does someone else in your household work outside the home? . . . . . [ ] 16
don't know(8) refused(9) yes(1) no(2)
(If no, go to Question 6.)

5C. How do you/they usually get to work? (Code only one. If any part of the trip is by bus or train, code bus or train. If by bus and train, code train. Read list.) . . . . . driving alone . . . . . (1)
(If 1, go to 5D.1.)
in a car or van pool . . . . . .(2)
(If 2, to to 5D.1.)
bus . . . . . (3)
(If 3, go to 5E.)
MARTA train . . . . . (4)
(If 4, go to 5E.)
walk, bike, or other . . . . . .(5)
(If 5, go to Question 6.)
don't read → don't know . . . . . .(8)
(If 8, go to Question 6.)
refused . . . . . (9)
(If 9, go to Question 6.)
[ ] 17

5D.1. Could you/they ride a bus or MARTA train to work? . . . . . [ ] 18
don't know(8) refused(9) yes(1) no(2)
(If no, go to Question 6.)

5D.2. Assuming today's bus and MARTA train fares remain the same, at what price per gallon of gasoline would you/they change to the bus or train? I'll read you some ranges. (Read only ranges 1 to 6.)

(1) less than $1.50
(2) $1.50 to $1.74
(3) $1.75 to $1.99
(4) $2.00 to $2.99
(5) $3.00 to $4.00
(6) over $4.00

don't read → (7) never
(8) don't know
(9) refused

[ ] 19

(Go to Question 6.)

5E. Could you/they get to work in a car, truck, van or motorcycle? . . . . . 20 ☐
don't know(8) refused(9) yes(1) no(2)

6. So that your answers will influence the planning for your area, what is your address? (Residence address, not mailing address. Do not abbreviate except for Street Type and Sector. Use only 2-letter abbreviations such as CR, CT, DR, LN, RD, or ST for Street Types. Use only NE, NW, SE, and SW for Sector.)

Street Number 21-26

Street Name 27-49

Street Type 50-55 Sector

City 56-72

30 Zip Code 73-75

(If respondent refuses, ask for street names of nearest intersection. Do not code. If respondent refuses or does not know intersection, close survey and note on Call Record Card "2". Write intersection on line below.)

76-78 1 (2)

_____

7. How many cars, trucks, vans, and motorcycles are kept at your home for use by you or members of your household? . . . . . don't know(98) refused(99)
(If none, go to Question 9.) 9-10

8. For each vehicle, please give the following information:
(Read "For vehicle #1, what is the year, make, model, etc. . . . For vehicle #2, what is . . .) (If more than 8 cylinders/code "9". If don't know, mark "?", but do not code. If refused, mark "REF", but do not code.)

Vehicle number	Year	Make or manufacturer (write out, do not code)	Model (write out, do not code)	# of cylinders	How many miles are on this vehicle (1,000's)	M.P.G. of fuel	company owned? yes(1) no(2)
1	19				000		
2	19				000		
3	19				000		
4	19				000		
5	19				000		
6	19				000		

11-25
26-40
41-55
56-70 (3) 1
9-23
24-38

9. What is the combined total yearly income for everyone living in your home? I'll read some ranges; please tell me only the range number. (Read list slowly and include range number. Do not continue list after a response.)

(1)less than $5,000
(2)$5,000 to $9,999
(3)$10,000 to $14,999
(4)$15,000 to $24,999
(5)$25,000 to $34,999
(6)$35,000 to $49,999
(7)$50,000 and over
do not read → (8)don't know
(9)refused

39 [ ]

10. I'm going to read you several ways to conserve fuel. Please tell me if you have taken any of these actions in the past 2 years. Did you: (read list)

	not applicable(7) don't know(8) refused(9) yes(1) no(2)	
a.	move your home closer to your work?	40 [ ]
b.	change jobs, so that your work is closer to your home?	41 [ ]
c.	car or van pool more often?	42 [ ]
d.	change your type of transportation?	43 [ ]
e.	shop closer to home?	44 [ ]
f.	plan social or recreational activities closer to home?	45 [ ]
g.	plan to combine several activities into one trip?	46 [ ]
h.	increase use of other forms of communication such as telephone and letters rather that transportation?	47 [ ]
i.	purchase a more gas efficient vehicle?	48 [ ]
j.	reduce the number of vehicles owned by your household?	49 [ ]

11A. (Pick up on Screener.)

11B. We would like you to fill out the form on October/November _____.
(If refused, code "9" here . . . . . 50 [ ]
and mark Call Record Card "1".)
A day or two later, we will have someone pick up your form. Will you please give me your name for mailing the form? _____.
(If refused, write "resident")
Is your mailing address the same as your residence? (Make sure you have an address in Question 6.) (If no, ask for mailing address.)

street or box _____.

city,state,zip _____ GA _____.

11C. (Pick up on Screener.)

(HAVE YOU REMEMBERED TO CODE THE PHONE NUMBER ON PAGE 1?)

A-2750

ATLANTA REGIONAL COMMISSION
COMPANY-OWNED VEHICLE FORM

Date to be completed: /__-__-80

Make_____ Model_____ Year-19__ Tag #-_____

Trip	Odometer Reading (mileage on vehicle)	Time of day (circle AM or PM)	Trip	Odometer Reading (mileage on vehicle)	Time of day (circle AM or PM)
1	Start	AM PM	13	Start	AM PM
	End	AM PM		End	AM PM
2	Start	AM PM	14	Start	AM PM
	End	AM PM		End	AM PM
3	Start	AM PM	15	Start	AM PM
	End	AM PM		End	AM PM
4	Start	AM PM	16	Start	AM PM
	End	AM PM		End	AM PM
5	Start	AM PM	17	Start	AM PM
	End	AM PM		End	AM PM
6	Start	AM PM	18	Start	AM PM
	End	AM PM		End	AM PM
7	Start	AM PM	19	Start	AM PM
	End	AM PM		End	AM PM
8	Start	AM PM	20	Start	AM PM
	End	AM PM		End	AM PM
9	Start	AM PM	21	Start	AM PM
	End	AM PM		End	AM PM
10	Start	AM PM	22	Start	AM PM
	End	AM PM		End	AM PM
11	Start	AM PM	23	Start	AM PM
	End	AM PM		End	AM PM
12	Start	AM PM	24	Start	AM PM
	End	AM PM		End	AM PM

Mileage at end of day _____

Number of trips in excess of 24 __

The information obtained in this survey will be confidential. It will be used for transportation planning purposes only.